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ERRATUM

Vol. **15.** no. 9. p. 312 (abst. 1900).—For " work undertaken in the U.S.A.", read " work undertaken in England and Wales."

Bulletins on disease subjects written for farmers and " popular " articles of a similar nature are not included in the *Veterinary Bulletin.* Those of a sufficiently important nature are, however, included in *Index Veterinarius* ; so also are certain review articles, presidential addresses, congress proceedings, etc., where the title conveys as much information as could be given in an abstract of a few lines. For information of this nature, readers of the *Veterinary Bulletin* are referred to *Index Veterinarius*, where titles of all publications indexed by the bureau are fully cross-referenced.

A list of annotations and reviews, classified according to subject, is now given in *Index Veterinarius*, being inserted at the end of each number. Such papers will not necessarily be dealt with in the *Veterinary Bulletin.*

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DISEASES CAUSED BY BACTERIA AND FUNGI

BRYAN, C. S. (1944.) **Mastitis control requires sanitation and treatment.**—*Quart. Bull. Mich. agric. Exp. Sta.* **26.** 268–273. **1916**

A general discussion on the circumstances in which chemotherapeutic infusions are indicated for udder derangement.—J. C. BUXTON.

HARE, T. (1943.) **Dung and droplets.**—*Vet. J.* **99.** 197–202. **1917**

H. discusses the control of diseases spread by dung or droplets. He suggests that streptococcal mastitis in cows may be a localization secondary to a throat infection. He deplores our lack of knowledge of the bacterial flora of the throat, vagina and other mucous membranes in health and disease.—M. LEVI.

U.S.A. (1943.) **Recommendations for increasing milk production through proper milking and mastitis control. Second report of the Committee on Animal Health of the National Research Council.**—*Repr. nat. Res. Coun., Wash.* No. 120. pp. 9. **1918**

The physiology of milk secretion is explained simply. Good management and handling of the cow at milking time, together with the control of mastitis, are considered the main points at which improvement is necessary.

Details important in ensuring rapid and complete milking are discussed at length, and an extensive bibliography covering all aspects of mastitis and milk secretion is appended.—C. M. FORD.

WILDE, J. K. H. (1945.) **Experiments to ascertain the effect of certain chemical solutions on anthrax spores.**—*Vet. J.* **101.** 64–65. **1919**

The object of the experiment was to find a suitable agent for the disinfection of hides against anthrax in Tanganyika. Sodium fluosilicate, sodium fluoride, lysol, formalin and sodium nitrite in different concentrations were tested for varying periods. No growth developed in the anthrax culture exposed to 5% formalin for half-an-hour. A 5% solution of sodium nitrite containing a trace of acetic acid was less successful. All the other solutions proved useless. W. does not recommend the use of any of the agents.—R. M. L.

*BOSGRA, O. (1942.) **[Control of bovine tuberculosis in Groningen.]**—*Tijdschr. Diergeneesk.* **69.** 519–527. [Abst. from abst. in *Wien. tierärztl. Mschr.* **30.** 153.] **1920**

It is stated that half of all the cattle in Groningen are examined annually for TB. According to the latest information 40% of the examined cattle show no sign of TB. The bulk of the article is a discussion on the disappointing progress in building up and conserving TB.-free herds. The preferential treatment afforded these in the past does not appear to be sufficient to induce herd owners to make the effort to keep their herds free. The advisability of introducing a law to enforce control is discussed.—J. E.

DAS NEVES E CASTRO, A. V. (1943.) Um projecto de campanha contra a tuberculose bovina. **[Plans for the control of bovine TB. in Portugal.]**—*Rev. Med. vet., Lisboa.* **38.** 209–244. **1921**

The author submits, for discussion by his colleagues, a scheme for the eradication of TB. in cattle. In his preliminary observations, he refers to the very high percentage of cattle in Portugal affected with granular vaginitis, and to the high incidence of brucellosis, and states that any eradication scheme must take into account these two diseases. He advises, however, that the campaign should be directed against all contagious and parasitic diseases of cattle, particularly those affecting the reproductive organs and causing sterility.

It is a matter of great urgency to revise the present system of slaughter of reactors to the tuberculin test, from the economic, scientific and social points of view, but care must be taken lest there should be a marked diminution in the total number of cattle, such as happened in the years 1935–1940. This was attributed to a reaction on the part of owners to the prevailing system, which involves the use of a single intradermal tuberculin test with Koch's Old Tuberculin, and slaughter of reactors. The author considers that it is uneconomical and unnecessary to slaughter cattle affected with localized " closed " TB., as in his opinion many of them recover. He supports this policy by pointing out that in England no rigorous control is undertaken, because of the danger of interfering with the milk supply of the nation.

In describing the eradication campaign, the author refers to the disadvantages of collecting large numbers of cattle together for tuberculin testing as has been done in Portugal. This involves the danger of spread of brucellosis and granular vaginitis. Again, cattle forced to travel long distances, often in unsuitable weather conditions, run the risk of contracting respiratory diseases and mastitis, and of abortion. The campaign should not be based solely on the results of the tuberculin test as now used, with its dangerous false negative reactions, and its uneconomical false positive reactions. It is known that in man the onset of certain febrile diseases gives rise to anergy to tuberculin, and that the allergic state returns on recovery. It would be interesting to find out if this also applies to cattle, particularly in the case of granular vaginitis, and acute, chronic, or purulent metritis. Hypovitaminosis C, too, is known to be associated with variable allergic reactions, a point which might be worth investigating in the bovine. False positive reactions are high in

number in Portugal as compared with the U.S.A. This the author attributes to the use of Old Tuberculin in Portugal, and to the fact that in the U.S.A. there is a concurrent campaign against avian TB. Other causes of false positive reactions are Johne's disease, actinobacillosis, "skin TB.", distomatosis, echinococcosis, and even brucellosis.

He advocates the use of synthetic medium tuberculin, the sites of choice being the neck or shoulder, since the use of the caudal or vulvar folds involves the risk of spreading diseases of the reproductive organs. All open cases of TB. should be slaughtered on detection, and constant vigilance should be maintained over reactors. Owners of slaughtered animals should be compensated, especially when they desire to build up tubercle-free herds. He refers to the need for general attention to hygiene, including the disinfection of places where infective cattle have been housed. To facilitate this, abattoir staff should co-operate with the veterinary surgeons in the field, by making known the sources of cases of open TB. so that foci of infection may be attacked immediately. The author also refers to the importance of the nutrition and general care of young stock and to the need for measures to educate stock owners in what is required for the improvement of livestock. He suggests that a commission be appointed to watch the progress of the campaign and to report thereon.—I. W. Brocklehurst.

Jensen, K. A., & Kioer, I. (1943.) Tuberkuloseprophylaxe und -Therapie in Experimenteller Beleuchtung. Mitteilung I. **[Experimental prophylaxis and therapy of tuberculosis. I.]**—*Acta path. microbiol. scand.* **20.** 133–198. [In German.] **1922**

The first part of this article deals with the development of TB. in g. pigs infected with bovine tubercle bacilli by droplet infection. The animals were killed after varying periods of time, and the numbers of viable tubercle bacilli in the lungs and spleen were estimated by colony counts. This work has been previously reported by Jensen and various colleagues. After g. pigs had been vaccinated with BCG, and had reacted strongly to tuberculin they were infected with virulent bovine tubercle bacilli by inhalation and showed considerable resistance to multiplication of the organisms, as compared with unvaccinated animals. The number of organisms found in the primary lung lesions in vaccinated animals was much less than in the controls; haematogenous spread was slight and of short duration.

A variety of sulphonamides was tested against tubercle bacilli *in vitro*; only sulphathiazole and sulphamethylthiazole had any effect in preventing the appearance of colonies when included in the medium in a concentration of 2·5 mg. %. The administration of the various preparations *per os* to experimentally infected g. pigs was without effect. When injected subcutaneously twice daily, the two preparations referred to above seemed to be of value. Sulphamethylthiazole reduced considerably the severity of infection produced by the inhalation of tubercle bacilli; there were fewer and smaller lesions and less haematogenous spread. Sulphapyridine had no effect either *in vitro* or *in vivo*. The appearance of lung lesions in treated and untreated animals is illustrated in a number of photomicrographs.—E. G. White.

Urbain, A., Nouvel, J., & Bullier, P. (1943.) Tuberculose et osthéopathie hypertrophiante chez un tapir américain (*Tapirus terrestris*, L.). **[Tuberculosis and hypertrophic arthritis in a tapir.]**—*Bull. Acad. vét. Fr.* **16.** 132–135. **1923**

The authors describe a case of TB. in a tapir affecting the right lung with concomitant non-tuberculous purulent osteomyelitis of the right mandible, the rest of the skeleton being normal. [The reasons why this case should be considered as one of hypertrophic osteo-arthropathy are not clear.]—M. Levi.

Burnet, Et. (1942.) Sur les essais d'inoculation de la lèpre humaine aux rongeurs d'après quelques expériences récentes. **[Inoculation of rodents with the leprosy bacillus.]**—*Arch. Inst. Pasteur Tunis.* **31.** 20–26. **1924**

B. reviews some of the literature dealing with the problem of the infection of laboratory animals with human leprosy and quotes experiments he has undertaken. He concludes that the experimental reproduction of human leprosy in animals has not yet been attained and calls attention to the possibility of misleading experiments resulting from the inoculation of leprotic material contaminated with other acid-fast organisms. —J. Lochiel McGirr.

*Stenius, R. (1943.) Räkätautiepizootia vuosina 1941–42. **[Outbreak of glanders in Finland.]**—*Suom. Eläinlääkäril.* **49.** 208. [Abst. from abst. in *Z. Fleisch- u. Milchhyg.* **54.** 27.] **1925**

Two cases of glanders were confirmed in August 1941. Seventy thousand horses were examined clinically, serologically and with mallein, and 33 more cases were revealed. After all infected premises had been examined three times with negative results, no further steps were taken and no cases were reported subsequently.—Ann F. Russell.

Reis, J., & Bueno, R. C. (1943.) Vacinação e mortalidade na cólera aviária. **[Increase in mortality following vaccination against fowl cholera.]**—*Arq. Inst. biol., S. Paulo.* **14.** 81–86. [English summary.] **1926**

Live vaccine should not be used in the beginning of an epidemic of fowl cholera, as this involves the risk of losing many birds because their resistance is lowered by the inoculation.

The authors distinguish between "contaminated birds" and healthy carriers. The latter have an acquired immunity, whilst "contaminated birds" are those which harbour *Pasteurella aviseptica* in the palatine cleft. The resistance of these birds breaks down following vaccination but if they are left unvaccinated, the pasteurella soon disappear from their mouth cavities.—Isobel W. Brocklehurst.

D'Apice, M. (1943.) Observações sobre o abôrto contagioso das eguas em S. Paulo. **[Contagious abortion in mares in Sao Paulo.]**—*Arq. Inst. biol., S. Paulo.* **14.** 235–242. [English summary.] **1927**

Salmonella abortus-equi was isolated from an outbreak of abortion in mares. The disease was brought under control by the administration of three 5 ml. doses of a phenolized suspension of the organism, given at weekly intervals during the third month of pregnancy, the usual sanitary measures also being undertaken. —Isobel W. Brocklehurst.

Atkinson, N., & Woodroofe, G. M. (1944.) **The occurrence of salmonella types in Australia. 1.**—*Aust. J. exp. Biol. med. Sci.* **22.** 51–55. **1928**

The various strains of salmonella isolated and identified by veterinary and medical workers in Australia are listed. Eleven different species have been identified, infections by *S. typhi-murium* predominating in both man and animals. Of 35 strains of *S. typhi-murium* examined by the authors, 24 were isolated from infants and children and two strains were isolated from normal human carriers. It would appear that the salmonella infections of human beings warrant greater attention than has been given in the past.—D. F. Stewart.

Bader, R. E. (1944.) Zur Diagnostik der Suipestifer-

typen. **[Recognition of *Salmonella cholerae-suis* types.]**—*Zbl. Bakt. I.* (*Orig.*). **151.** 146–150. **1929**

Strains of the "Orient" type of salmonella [*S. paratyphi C*] have been recovered from the blood and stools of two Russian prisoners-of-war [HOHN, 1943]. Since this organism was a cause of human disease on the eastern front in the war of 1914–18, and a similar condition was due to *S. cholerae-suis* var. *kunzendorf*, the recognition of *S. paratyphi C* and its distinction from the several varieties of *S. cholerae-suis* assumed importance. Under field conditions, B. suggests that when *S. paratyphi C* has been distinguished by serological means, it may then be differentiated from the American, Kunzendorf, and Glässer-Voldagsen varieties of *S. cholerae-suis* by the following simple reactions. Arabinose is fermented within 24 hours by *S. paratyphi C* and the Glässer-Voldagsen variety only. Dulcite is fermented within 24 hours by *S. paratyphi C* and within 2–6 days by the Glässer-Voldagsen variety, but only slowly, irregularly, or, generally, not at all by the others. H_2S is formed by *S. paratyphi C* and the Kunzendorf variety only.—E. COTCHIN.

PETERSEN, G., & SEIT, B. (1944.) Den smitsomme Kalvekastning. Dens Udbredelse og Manifestation i et større samlet Omraade (Bornholm) og Forløbet af Bekaempelses forsøg i en 5-aarig Periode. **[Bovine brucellosis in Bornholm and its control over a five-year period.]**—*Maanedsskr. Dyrlaeger.* **56.** 177–208 & 209–240. **1930**

This is a detailed account of an unfinished campaign lasting over five years for the control of bovine brucellosis on the island of Bornholm. The campaign was organized in 1937 by the Danish Veterinary Directorate and an annual fund of 100,000 kroner was available for expenses; the work was put on a voluntary basis and nearly every herd was enrolled.

The main features of the scheme were diagnosis by blood testing, conservation of clean herds, and removal of reactors in herds having one or a very few infected animals; infected herds and herds having many reactors were segregated, sometimes in groups, and vaccinated. Orthodox disinfection measures were also prescribed.

3,790 herds were enrolled, of which two-thirds were small ones having fewer than ten cattle over one year old. The initial blood test showed that 1,259 (33·2%) were infected. 461 other herds (12·2%) also became infected during the campaign period and 1,046 (60·8%) became cleansed of infection. 674 herds remained infected at the close of the five-year period.

The most effective way of ridding a herd of slight infection was by the prompt removal (by sale) of infected animals. Isolation was much less effective. Evidence was also obtained that herds often rid themselves spontaneously of infection in the absence of energetic control measures by the farmer.

The Bornholm experiences are discussed along with those of other parts of Denmark in which the disease exists to a comparable extent. Experience suggests that area control is most likely to give good results, the dairy district being the most suitable unit to work on. More strict legislation is required to control the inter-island traffic of farm animals and feeding stuffs. The farmer must be educated to appreciate the measures necessary to prevent the spread of infection.—J. E.

*HORVAT, V. (1940.) Beitrag zur Kenntnis der Bruzellose bei Schweinen im Save-Banat. **[Porcine brucellosis in Save Province, Yugoslavia.]**—*Vet. Arhiv.* **10.** 489–499. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr.* Nov. 22nd. 569. (1940).] **1931**

The examination of 1,390 blood samples revealed that porcine brucellosis was widespread in Save Province, the percentage of infection on holdings varying from 1·5–80%, and usually being lowest on the small peasant holdings. Both agglutination and complement-fixation tests were used and gave similar results in 88·4% of samples.—ANN F. RUSSELL.

LEVINE, M. G. (1943.) **Brucellosis in packing-house workers.**—*J. industr. Hyg. Toxicol.* **25.** 451–452. **1932**

Twenty-four cases of acute brucellosis were admitted to the Cook County Hospital, Chicago, in 1942. Special enquiry was made as to the possible source of infection in 17 of these patients employed in meat packing factories. Many of them denied contact with meat; their work was at some phase in the canning process of meat products, mostly pork. On persistent questioning they reluctantly admitted that they were in the habit of surreptitiously eating pork, tongue, sausages or meat only partially cooked. It was found that this habit was common among the workers and it is probable that the high incidence of brucellosis in meat factory employees is due to the ingestion of such partially cooked products rather than to direct contact while handling meat.

Education of the workers to avoid this risk is advocated.—M. C.

MACRAE, D. R., MURRAY, E. G., & GRANT, J. G. (1943.) **Entero-toxaemia in young suckled calves.**—*Vet. Rec.* **55.** 203–204. **1933**

The authors describe an acute, highly fatal disease of calves, occurring generally in the first week of life, but occasionally up to the second month. Cases occurred on farms stocking sheep, which were subject to one of the enterotoxaemias, or in which sudden unexplained deaths often occurred. The symptoms and lesions found P.M. resembled those of lamb dysentery. *Clostridium welchii* Type A was isolated from the alimentary tract of calves in two outbreaks. Lamb dysentery antiserum was shown to have some curative and marked prophylactic value.

[Diagnosis apparently rested on the demonstration of *Cl. welchii* A in the faeces, and in one case in the tissues of affected animals. There is no record of any attempt to demonstrate the presence of toxin in the alimentary tract.]—ISOBEL W. BROCKLEHURST.

*PETERSON, H., & KÕIVASTIK, T. (1942.) **[Viability of tetanus spores in dry soil at laboratory temperatures.]**—*Eesti Arst.* **21.** No. 6. [German summary.] [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 84.] **1934**

A tetanus spore suspension which had stood for 50 years in a sealed vessel containing earth, when injected into mice and g. pigs did not produce symtoms of tetanus within two months; a culture in the third generation incubated for 10 days at 37°C. produced a toxin lethal to mice in 4–6 days in a dose of 0·005 ml. —R. M. LOOSMORE.

MILES, A. A. (1944.) **Epidemiology of wound infection.**—*Lancet.* **246.** 809–814. **1935**

M. reviews recent research on the dynamics of the bacterial flora of human wounds. *Staphylococcus aureus* and *Streptococcus pyogenes* are studied especially from the point of view of their incidence and their traceable sources. Airborne or contact infection occurring during the medical treatment of wounds in surgical wards can be reduced by the application of the prophylactic measures outlined.—M. LEVI.

See also absts. **1959**, **1966**, **1970**, **2068** (streptococci), **2053**, **2094** (mastitis), **1985**, **1986** (strangles), **1965** (anthrax), **2077**, **2078** (TB.), **1967** (Stefansky's bacillus), **2054** (fowl cholera), **2055**, **2069** (swine erysipelas), **2056** (calf "scours"), **2094** (bovine brucellosis), **2092**, **2093** (viability of bacteria), **2046–2052** (antibiotic microbial derivatives), **2021** (vitamin K and intestinal flora).

DISEASES CAUSED BY PROTOZOAN PARASITES

KERR, W. R. (1944.) **The intradermal test in bovine trichomoniasis.**—*Vet. Rec.* **56.** 303–305. Discussion pp. 305–307. **1936**

K. emphasizes the features of the cattle-breeding system in Northern Ireland which are conducive to the spread of trichomoniasis, and also the difficulty of diagnosing the disease.

The skin test consists in the intradermal injection of 0·1 ml. of a trichomonad antigen, "tricin", into the skin of the neck as in the tuberculin test, a reading being made 30–60 min. later. A shallow plaque is the characteristic reaction, and a 2 mm. increase in the skin measurement is considered positive.

Desensitization of the skin may occur in certain infected animals, especially where pyometra exists. The best reactions are found in the mildly affected cow or bull, whereas with the agglutination test [see KERR & ROBERTSON—*V. B.* **12.** 408] the reverse is the case.

In intradermal tests on two infected herds, one in England and one in Northern Ireland, both showed a high percentage of positive reactors.

Antibody may be transferred passively from an infected cow to her calf *via* the colostrum; young stock therefore may react positively up to 9–18 months of age.

Intradermal tests were carried out on 594 slaughter cows; 12% reacted, and 40% of these cases were confirmed by direct examination, or were found positive to the aggln. test. Thirty virgin bulls and 50 bullocks were tested intradermally; only one bullock exhibited a swelling of more than 1 mm. thickness. Thirteen bulls from infected herds were positive to the intradermal test, 11 of which were also found to be infected by direct observation or to react serologically.

Of 63 slaughter bulls tested, 33% were positive to the intradermal test, and 42% of these results were confirmed either by direct examination or serologically.

The method of preparing "tricin" is described.
—ALAN E. PIERCE.

BROCKLEHURST, F. B. (1944.) **Trichomoniasis in the pigeon in Great Britain.**—*J. R. Army vet. Cps.* **16.** 130–132. **1937**

This record is based on the P.M. examination of a six-week-old carrier pigeon, one of many young birds which had died. Necrotic areas were found mainly in the liver, heart, and on the peritoneal surface of the sternum. Flagellates were demonstrated in wet preparations made from the liver, heart, and sternal lesions. One pigeon, inoculated intraperitoneally with macerated liver tissue and killed 25 days later, showed lesions similar to the first case, with additional involvement of the lungs. A second pigeon, which was fed with liver tissue, showed neither symptoms nor lesions, but trichomonads were found in the oesophagus and crop. The average size of the parasites obtained from all three cases was $10{\cdot}3\mu \times 5{\cdot}4\mu$. No record was made of the length or number of the flagella.

It is concluded that as serious outbreaks of trichomoniasis may occur in breeding establishments, the disease should be controlled by early detection and elimination of "carriers", hatching of eggs by healthy birds, and treatment with trypaflavine or iodine solutions.—M. L. BINGHAM.

KNIGHT, D. R., & MCDOUGLE, H. C. (1944.) **A protozoon of the genus Tetrahymena found in domestic fowl.**—*Amer. J. vet. Res.* **5.** 113–116. **1938**

Among white Plymouth Rock cockerels sent to the laboratory for diagnostic purposes, some of the birds were thin and had partially or totally impaired vision. Congestion of the eyelids was noted and they were distended over a quantity of pus. A slight serous nasal discharge was present. There was a gross indication of vitamin A deficiency. Smears from the length of the digestive tract and the infra-orbital sinuses and the serous material beneath the eyelids contained a large number of active ciliates of the genus *Tetrahymena* which when fixed measured $40–50\mu$ in length and $15–30\mu$ in width. [A detailed description is given of the morphology.] The possible source of infection was thought to be a pool, and the carrier a dog which may have carried the organism from the pool to an open water-trough in the yard in which it frequently bathed. The part played by *Tetrahymena* in the infection is not understood. As the ciliate can use dissolved organic substances as food it might have become adapted to the conditions of the digestive tract, etc. The condition of the cockerels was possibly lowered by inadequate diet which enabled the protozoa to establish themselves and to deplete the birds of essential food substances, including vitamin A. [As the authors rightly point out much work must be undertaken on artificial inoculation of susceptible birds and on the nutritional requirements of the ciliate before it can be assumed that *Tetrahymena* can become a true parasite in higher animals.]—C. H. S.

BROOKE, M. M. (1945.) **Effect of dietary changes upon avian malaria.**—*Amer. J. Hyg.* **41.** 81–108. **1939**

B. discusses the belief that the incidence and severity of epidemics of malaria in man are correlated with either undernutrition or malnutrition. Experiments are described which were designed to test the influence of alterations in the diet on birds infected with avian malaria. Canaries, pigeons and ducks were infected with one or other of two strains of *Plasmodium relictum*, one of *P. cathemerium*, and one of *P. lophurae*.

The test diets were high in carbohydrates and low in practically all other nutritional values, though one diet was deficient only in vitamin B_1 and one was quantitatively reduced. Observations were made on the birds, resistance to primary attack, tendency to relapse and immunity to superinfection.

In general, the birds on the experimental diets had more severe primary attacks, greater tendency to relapse, and less resistance to superinfection. There were more fatal infections among the poor-diet groups and the symptoms were more severe. In birds with latent infections, parasites reappeared only in those on poor diets. A diet deficient only in vitamin B_1 did not provoke relapses in pigeons with latent infections nor did it lower their resistance to superinfection.

A total of 125 birds was used but the number varied from 5–20 in any one experiment.—M. C.

See also absts. **1975** (piroplasmosis in U.S.S.R.), **2058** (bovine coccidiosis), **2081** (avian spirochaetosis), **2095**, **2106** (trypanosomiasis).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

IDSØ, P. T. (1943.) Måkene som mulige smittespredere og skadedyr forøvrig. **[Seagulls as carriers of infection (including foot and mouth disease).]**—*Norsk VetTidsskr.* **55.** 84–86. **1940**

The possibility is discussed of seagulls being transmitters of infectious diseases especially F. & M. disease, outbreaks of which occur simultaneously in widely separated and unfrequented districts, often with no road communications between.

Seagulls frequent dunghills where virulent infec-

tious material may well be present and cowsheds where they may be in direct contact with infectious material.

The capture on a large scale by a butcher in Hangesund of seagulls as an addition to the food supply is therefore hailed as a useful piece of work from every point of view. State-organized support is recommended for the control of seagulls.—M. E. ROBERTSON.

FOLEY, E. J. (1944.) **Nature of the reinfection response in fowl pox.**—*Cornell Vet.* **34.** 281–284. **1941**

Seven-week-old chickens inoculated with fowl pox virus developed typical lesions within three days. Eight days later scarification of another site with the virus was followed in 30 hours by the rapid development of lesions. These lesions reached their maximum in 48 hours and had virtually disappeared in five days. A parallel is drawn between this response and allergic reactions when tuberculin or vaccine virus is introduced into a hypersensitive host. The histopathological findings support this analogy, for the reinfection response was found to be characterized by extensive monocyte or histiocyte infiltration, a feature commonly seen in sections of typical allergic lesions and lacking in the response to initial infection with fowl pox virus. It is emphasized that the results observed followed the use of large doses of virus and the most severe reinfection reactions occurred in association with areas of epithelial damage such as follicles from which the feathers had been plucked.—J. B. BROOKSBY.

SHARP, D. G., TAYLOR, A. R., MCLEAN, I. W., Jr., BEARD, D., & BEARD, J. W. (1944.) **Sedimentation velocity and electron micrographic studies of influenza viruses A (PR8 strain) and B (Lee strain) and the swine influen°a virus.**—*J. biol. Chem.* **156.** 585–600. **1942**

Studies were made on the purification of influenza virus using virus A (PR8 strain) and B (Lee strain) and the swine type. From sedimentation data obtained with the analytical ultracentrifuge and from electron micrographs, the three types of virus were found to be ovoid or rounded particles of about 80, 100, and 80 mμ, respectively. Chemically the three types were similar in constitution. The particles of a given preparation of influenza virus vary not only in size, but also in shape as seen in electron micrographs. The mean image size in electron micrographs and the mean sedimentation rate in the ultracentrifuge remain constant in all preparations of any one type thus far studied. Differences have been observed in sedimentation constants with the different types of virus, and a dependence of sedimentation rate on virus concentration has been noted. In this investigation analyses were made of the distribution of particle sizes and the mean particle sizes determined by the two methods, and the findings were compared directly. Studies were also made on the variation of the rate of sedimentation with virus concentration. The data obtained from sedimentation characteristics of the three influenza viruses dispersed in a saline medium, and direct visualization in electron micrographs were in agreement within close limits with respect to particle size distribution, and to a less extent, to the mean particle size. The sedimentation constants of the three types of virus were found to vary with the concentration of the virus in the dispersing fluid. There was only one anomaly in the case of virus B, when the virus was dispersed in Ringer-$CaCl_2$ solution. Apart from this, the relation between the sedimentation constant and virus concentration seemed to be linear. Extrapolation of the linear relation to infinite dilution of the virus gave values of $S_{20°} = 742 \times 10^{-13}$, 840×10^{-13}, and 727×10^{-13} for PR8 strain, Lee strain, and swine influenza virus respectively. The partial specific volumes were determined by measurements with the pyknometer, and from all these data the values for the mean particle diameter were found to be 80·1, 100·4, and 86·8 mμ respectively. Values obtained from the electron micrographs, calibrated by means of the width of the tobacco mosaic virus rods as standard were 80·0, 97·6, and 76·8 mμ and were in good agreement. It was found that apart from the differences in mean particle diameter of the three strains there was a fairly wide distribution of particle sizes about the mean. This distribution was about the same for all three types. An outstanding character of the influenza viruses is that they are not monodisperse, being in this way somewhat similar to the elementary bodies of vaccinia, but differing from other animal and plant viruses obtained in purified preparations which have been studied. Information gained of the degree of heterogeneity of particle size and shape is of considerable significance. The electron microscope not only confirms the departure from monodispersity as indicated by the ultracentrifuge but shows clearly that the variations are in biologically similar particles, not in particle kind. It is concluded that the influenza viruses are not molecular in nature. Because of the homogeneity of preparations of purified rabbit papilloma and equine encephalomyelitis viruses these agents have been considered to be macromolecules similar in this respect to the plant viruses. Electron micrographs of the animal viruses studied have consistently corroborated the evidence of homogeneity or lack of it obtained by the ultracentrifuge. There has also in all instances been evidence of structure within the virus particles. This variation is not only within the substance of the individual particles; the internal structure may vary in form and arrangement from particle to particle. This is not in agreement with an idea that these viruses are macromolecules. The influenza viruses resemble much more closely the form and structure of pure cultures of certain small coccobacilli. The similarity extends further. In regard to their chemical constitution, both are composed of protein, fat and carbohydrate.—E. M. J.

STANLEY, W. M. (1945.) **The preparation and properties of influenza virus vaccines concentrated and purified by differential centrifugation.**—*J. exp. Med.* **81.** 193–218. **1943**

This important paper describes a series of experiments leading to the large-scale preparation of concentrated influenza virus vaccines for human use. Infected allantoic fluid was selected as the parent virus suspension and the value of derived products was assessed by the level of chick cell agglutinating units and by vaccination experiments in mice, since these two methods show a rough correlation.

Freezing should be avoided, especially in the case of phenolized and formalinized suspensions, since activity may be almost completely abolished; drying from the frozen state resulted in a 90–99% loss of virus activity. Formaldehyde and ultra-violet light are suitable as inactivating agents but chloroform or phenol cannot be recommended. Fully potent uninfective suspensions can be prepared by ultra-violet irradiation but this process is scarcely applicable on a large scale.

Differential centrifugation is preferred to concentration by adsorption on chick red cells. A single centrifugation cycle will concentrate at least 90% of the virus protein and yield a product with less than 5% protein of low molecular weight which is of no value as an immunizing agent, as against 90% in the original fluid.

The problem of bacterial contamination in large-scale operations can be overcome by the addition of 1 : 10,000 formalin and 1 : 100,000 phenyl mercuric nitrate to the allantoic fluid prior to processing; it is

advisable to maintain a low concentration of formalin since amounts in excess of 1 : 2,000 are liable to affect the antigenic structure and produce loss in potency of the vaccine.—R. E. GLOVER.

JACKSON, F. W. (1943.) **Encephalitis (western equine) in Manitoba—1941.**—*Amer. J. publ. Hlth.* **33.** 833–838. **1944**

The epidemiological features of an outbreak of Western equine encephalomyelitis in Manitoba in 1941 showed that the highest incidence rates in human beings occurred in infants under one year of age and in males who lived and worked in the open in rural area. Undesirable sequelae were very prevalent.

The experimental vaccination of 3,000 persons showed that neutralizing antibodies were probably present in 100% of those vaccinated, but that there was insufficient evidence from which to draw reliable conclusions as to the clinical efficacy of the vaccine.

—J. C. BUXTON.

SLAVIN, H. B. (1943.) **Persistence of the virus of St. Louis encephalitis in the central nervous system of mice for over five months.**—*J. Bact.* **46.** 113–116. **1945**

S. demonstrates that mice which have been passively immunized against the virus of St. Louis encephalitis may continue to harbour the virus for a considerable period following intranasal inoculation.

Twenty-eight mice, the progeny of hyperimmunized mothers, were inoculated intranasally with virus. They were then killed at intervals and their brains and spinal cords were emulsified and injected intracerebrally into susceptible mice. Of 14 pairs of mice used in this way, three pairs were shown to have been harbouring St. Louis virus in the C.N.S.—J. C. BUXTON.

VORONTSOV, S. M. (1941.) Patologo-gistologicheskie izmeneniya v tsentral'noĭ nervnoĭ sisteme loshadeĭ pri dal'nevostochnom entsefalite. [**Pathological and histological lesions in the central nervous system in Far East encephalitis in horses.**]—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses.*] pp. 49–52. **1946**

The author discusses the histological findings in 20 cases of Far East equine encephalitis. The changes in the brain were identical with those found in Borna disease. The lesions regarded as pathognomonic for Russian equine encephalomyelitis were not found in the liver.—A. MOLDAWSKY.

MARTIN, L. A. (1940.) L'anémie infectieuse des équidés. I. Recherches sur l'incubation et le premier accès thermique au cours de la maladie expérimentale. II. Données diverses sur le virus anémique. III. Recherches sur le traitement et la prévention de la maladie. IV. Adsorption du virus. Tentatives d'atténuation du virus adsorbé. [**Equine infectious anaemia. I. The incubation period in the experimental disease. II. Miscellaneous findings. III. Treatment and prophylaxis of the disease. IV. Adsorption of the virus and attenuation trials with adsorbed virus.**]—*Arch. Inst. Pasteur Maroc.* **2.** 259–287, 289–294, 295–303 and 305–321. **1947**

I. Research on the incubation period of equine infectious anaemia in North Africa, using donkeys as experimental animals, showed that the virus appeared in the blood within 2–5 days after inoculation, but the febrile reaction might be delayed for 10–29 days, and some animals proved resistant to the virus. The length of the incubation period appeared to depend on the resistance of the animals, and not on the type or quantity of the inoculum or on the route of administration. It was considered that a daily estimation of the leucocytic formula had value in prognosis.

II. The virus appeared to be widely distributed and was present both in the serum globulins and albumins. Attempts to transmit the disease to rabbits, g. pigs, a monkey and a lion were negative and an attempt to transmit infection to a donkey by bites of *Haematopinus asini* also failed.

III. Convalescent donkey serum produced some improvement when used early in treatment, but proved valueless in established infections. Dagenan was inactive, and convalescent serum had little value as a protective.

IV. The virus adsorbed on aluminium hydroxide remained virulent, and the addition of bile failed to modify the virulence, but exposure to formalin at concentrations of less than 1 : 10 provided a vaccine which was free from active virus, yet protected donkeys and mules from severe disease, though it did not prevent infection.—U. F. RICHARDSON.

BELLER, K., & SCHWARZMAIER, E. (1940.) Untersuchungen über die ansteckende Blutarmut der Pferde. I. Zur Epidemiologie und Diagnostik der ansteckenden Blutarmut. (Erfahrungen in Hessen über einen Zeitraum von 7 Jahren.) [**Research on equine infectious anaemia. I. Epidemiology and diagnosis.**]—*Arch. wiss. prakt. Tierheilk.* **76.** 24–38. **1948**

BELLER, K., & TRAUB, E. (1942.) Untersuchungen über die ansteckende Blutarmut der Pferde. II. Übertragungsversuche. [**Research on equine infectious anaemia. II. Transmission experiments.**]—*Ibid.* **77.** 411–422. **1949**

I. The authors studied the nature, course, and diagnosis of E.I.A. in a circumscribed and epidemiologically easily supervised area. They base their conclusions on 14 years' experience in histological examinations and seven years of combined haematological and histological investigations. They state that (1) the disease is largely confined to particular districts and does not always spread, but may fade out as horses die which were infected when they entered the district and (2) even when infection does occur it may not necessarily lead to clinically recognizable symptoms in the animals concerned.

II. In an attempt to produce contact infection in E.I.A., an artificially infected foal was kept for several weeks, until its death from the disease, in the same stall as two healthy foals, the animals using the same manger and self-watering bowls; no transmission of infection occurred.

The repeated application of urine from an artificially infected horse to the undamaged skin of the fetlocks of a sound horse did not set up infection. Two or three injections of nasal washings from a horse affected with E.I.A. into the nasal passages of an experimental horse set up infection, in one case with only two injections. It is concluded that the virus of E.I.A. can penetrate into the body through undamaged nasal membrane and the possibility is entertained that nasal infection occurs under natural conditions, especially under conditions of hard work; it is suggested that increased respiratory effort during active work may be a factor.

The strain of virus used for these experiments did not lose its pathogenic properties during serial passage and after repeated dilution in the course of passage in animals.—J. ZWEIG.

OPPERMANN, T., & OPPERMANN, M. (1943.) Über die Symptomatologie der chronischen und latenten Form der ansteckenden Blutarmut der Einhufer. [**Symptomatology of chronic and latent equine infectious anaemia.**]—*Dtsch. tierärztl. Wschr.* **51.** 130–135. **1950**

It is suggested that war conditions are likely to activate chronic and latent cases of equine infectious anaemia, thus producing active outbreaks of the disease.

Chronic cases are characterized by unsatisfactory condition in spite of good food. Both appetite and thirst are increased, the former leading to the eating of bedding and an abnormal quantity of faeces, and the latter to polyuria, commonly associated with diarrhoea. There is loss of elasticity of the skin, wounds heal slowly and tend to become persistent sores, whilst the coat is staring, rough and long. Fever is always present, but is due to protein destruction rather than septicaemia, and is peculiar in that it is unaccompanied by other symptoms such as loss of appetite, and tends to rise in the evening.

Oedema occurs under the breast and abdomen, but this may disappear with rest. The pulse is shallow and the rate may be high, but it is typical for the rate to increase with slight exercise and to decrease quickly with rest. There may be irregularity of the systolic heart sounds. Conjunctival symptoms are not considered specific, but the mucous membrane of the eyelids may be dark red, yellowish, waxy or porcelain, the variations being dependent on circulatory derangement which may be associated with liver dysfunction or severe anaemia. Blindness is sometimes associated with infectious anaemia, and may be due to an autointoxication. The differential diagnosis of chronic nephritis and diarrhoea due to parasitism is discussed, there being an oedematous condition of the bowel mucous membrane in infectious anaemia.

The value of blood examination and the sedimentation test in the diagnosis of infectious anaemia is considered but it is concluded that diagnosis must rest on the clinical symptoms, epidemiological characteristics and autopsy findings; the corrosive sublimate test has a value, as a positive test indicates the presence of an antibody in the blood.

Latent cases are described as exhibiting slight unthriftiness, and the corrosive sublimate test may be of value in detecting them. Good feeding and management may prevent the breakdown of such cases and the recurrence of active disease in the stud.—U. F. R.

TEVOSOV, A. M. (1941.) Vospriimchivost' mulov i oslov k infektsionnoĭ anemii loshadeĭ. **[The susceptibility of mules and asses to equine infectious anaemia.]** —*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses.*] pp. 36–41. **1951**

Observations were made on infected farms on which horses, mules and donkeys were kept in close contact. Comparative studies were also made on two foals, two donkey foals and two mule foals which were infected with virulent blood. As a result of his clinical, haematological and P.M. findings, T. concludes that under experimental conditions donkey and mule foals are as susceptible to E.I.A. as are horse foals. Under natural conditions donkeys and mules are more resistant but not immune. Three mules suspected of E.I.A. were under observation for three months. One of them showed rises of temperature up to 39–40·5°C. on ten occasions and some slight reduction in haemoglobin and erythrocytes.—A. MOLDAWSKY.

AVRAMENKO, G. D. (1941.) Ustoĭchivost' virusa infektsionnoĭ anemii v sene pri razlichnykh usloviyakh khraneniya. **[The viability of the virus of equine infectious anaemia in hay under different methods of preservation.]**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses.*] pp. 30–33. **1952**

In three lots of hay contaminated with virulent blood, which were preserved from April to October, July to March and December to August the virus remained viable for 180 days. After 210 days on infection of foals could be achieved with filtrates of these samples.—A. MOLDAWSKY.

PETROPAVLOVSKIĬ, V. P., MOREV, V. I., & SEMAEV, V. A. (1941.) Elektroliticheskaya resistentnost' eritrotsitov pri infektsionnoĭ anemii loshadeĭ. **[Electrolytic resistance of erythrocytes in equine infectious anaemia.]**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses.*] pp. 17–23. **1953**

Using specially constructed capillary tubes the authors investigated the electrolytic resistance of the erythrocytes of ten horses infected with equine infectious anaemia, seven in which infection was suspected and ten normal horses. With two exceptions it was found that the resistance of the erythrocytes at the anode and cathode during E.I.A. was half the normal value. Varying results were obtained in doubtful cases of E.I.A. In the authors' opinion the lowering of the resistance during E.I.A. is due to the influence of virus absorbed by the erythrocytes. Differences in the electrolytic resistance were also found between young and old forms of erythrocytes, thus enabling observation to be made on various phases of erythropoiesis.

The authors emphasize that these methods are not of practical diagnostic value as the electrolytic resistance of erythrocytes is a non-specific reaction.—A. M.

ANDRIEVSKIĬ, I. I. (1941.) O srokakh karantina pri infektsionnoĭ anemii loshadeĭ. **[On the duration of quarantine for equine infectious anaemia.]**—*Trud. XV Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Diseases of Horses.*] pp. 33–35. **1954**

A. criticizes the existing six months' quarantine regulation which is a heavy burden to farms affected with equine infectious anaemia. In his opinion this period is justified neither by present knowledge regarding the incubation period, nor with regard to the possibility of infection through blood-sucking insects from carriers: the incubation period rarely exceeds two months and the possibility of transmission through blood-sucking insects may occur after 5–10 years. Therefore A. recommends the shortening of quarantine to three months with the prolongation of the post-quarantine restrictions on movement and sale of horses to non-affected areas, etc.—A. MOLDAWSKY.

ALICE, F. J., & MCNUTT, S. H. (1945.) **A study of lymphocytic choriomeningitis virus.**—*Amer. J. vet. Res.* **6.** 54–60. **1955**

A strain of lymphocytic choriomeningitis was isolated by the intracerebral inoculation of g. pigs with bovine cerebral material. The strain was slightly more virulent than two standard L.C. viruses, but was otherwise identical (when tested by the infection of mice, neutralization tests, etc.). Young chicks exhibited no clinical symptoms, but the virus persisted in the tissues for at least five weeks.

Attempts to transmit the agent to a bull, a pregnant cow and two calves were unsuccessful; in addition no evidence was obtained that the virus was present in a latent form in the g. pig stock. The origin of the strain was, therefore, obscure.—R. E. GLOVER.

*VITTOZ, R. (1940.) Résultats enregistrés en Cochinchine au cours de huit années de sérothérapie antipestique curative (sérum-pulpe de Nha-Trang). **[Eight years' experience in Indochina with curative serum treatment of rinderpest.]**—*Rec. Méd. vét. exot.* **13.** 5–16. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 127.] **1956**

Since 1930 numerous contact cattle and buffaloes in infected herds in the province of East Cochinchina have been treated for rinderpest by the mixed serum

spleen-pulp method of Jacotot. Serum treatment should not be used in animals in low condition, or in those showing mouth ulceration or dysentery. Intravenous injection causes shock and should therefore be avoided in animals showing a high temperature. The serum is best given subcutaneously in quantities of 20 ml. at each injection so that buffaloes receive a total of 120 ml. and cattle 80–100 ml. To simplify the technique for field operations one injection of the total quantity can be given, but the method of choice appears to be the subdivision of the dose into 2–3 parts.

—U. F. RICHARDSON.

VERGE, J. (1944.) Les rapports entre le virus de la peste porcine vraie et le virus de la peste porcine de l'Afrique orientale. **[Relationships between the viruses of true swine fever and East African swine fever.]**—*Bull. Soc. Path. exot.* **37.** 12–15. **1957**

Attention is drawn to the fact that immunity to African swine fever does not confer immunity to true swine fever, nor *vice versa*, and it is stated that the two viruses must be considered distinct. The danger is indicated of the introduction of this disease into France by the importation of pork and pig skins.—U. F. R.

KÖVES, J., HEGYELI, Z., & GÖZSY, B. (1943.) Die Erhaltbarkeit des Schweinepestvirus. **[The preservation of swine fever virus.]**—*Arch. viss. prakt. Tierheilk.* **78.** 289–301. **1958**

The authors report experiments performed to ensure the availability of active virus for immunizing swine against S.F. by the simultaneous inoculation of virus and serum. The survival of virus was studied in defibrinated blood, in serum and in spleen pulp following various conditions of storage. The authors conclude that the best method of preservation is by drying the infective material *in vacuo* from the frozen state but they recommend that virus preserved by the addition of 0·3% phenol should be used for the simultaneous method of immunization, provided there is no long period of storage and that care be taken to keep it in the cold, especially during warm weather. [It is difficult to draw conclusions from the results of these experiments as, although quantitative tests were made, an end-point was not always obtained and no mention is made of the original virus content of the materials being tested.]—W. M. HENDERSON.

ROSENOW, E. C. (1943.) **Studies on the relation of a neurotropic streptococcus and virus to epizootic encephalitis of wild ducks.**—*Cornell Vet.* **33.** 277–304. **1959**

Two outbreaks of a highly fatal and paralytic disease of wild ducks were found to be due to epizootic encephalitis. Virus was obtained from the brains of some of the ducks and in addition an encephalic type of streptococcus was obtained from brains and faeces of affected birds. Neither the virus nor the streptococcus was obtained from normal ducks at a distance from the site of the outbreak.

The encephalic type of streptococcus was isolated from the water and mud from the bottom of the lake where the disease occurred, as was also the appropriate streptococcal antigen, the presence of which was demonstrated by means of the precipitin test carried out with encephalic streptococcal antiserum.

Both the streptococcus and the virus produced symptoms and lesions of encephalitis in laboratory animals, but evidence of the disease was less apparent after the inoculation of the streptococcus than when it was the result of the injection of filtrates containing virus. Both the filtrable infectious agent obtained from the streptococcus in autoclaved chick-embryo medium and the virus from the brains of infected ducks resembled equine encephalomyelitis virus (Western type) in symptoms and lesions produced in experimental animals and a degree of cross-neutralization was evident between the two.

Since the virus obtained from the brains of ducks and the infectious agent associated with the streptococcus could not be separated permanently from the organism, even after successive passages through experimental animals and embryonated eggs, R. suggests that the virus may be the filtrable and highly invasive stage of the streptococcus.—J. C. BUXTON.

WILLIAMS, S. E. (1944.) **The growth of psittacosis virus in the allantoic cavity of the developing egg.**—*Aust. J. exp. Biol. med. Sci.* **22.** 205–208. **1960**

Six strains of psittacosis virus were inoculated in 0·25 ml. doses into the allantoic cavity of developing eggs. The strains included one recently isolated from a highly fatal outbreak in Gouldian finches, and five stock strains of varying ages, two from pigeons and three from human beings. Infected allantoic fluid contained great numbers of Levinthal-Coles-Lillie bodies and excessive amounts of mucoid material. Death usually occurred on the 5th or 6th day. Most satisfactory results as regards the quantity and quality of fluid harvested and maximum multiplication of the virus were obtained if the eggs were 9–10 days old at the time of inoculation.

In titration experiments in mice the infective titre of allantoic fluid was compared with that obtained from infected yolk sac and chorio-allantois ; figures are given to show that the titre of allantoic fluid is the highest, 1 ml. containing about 109 infective doses for mice (by intranasal inoculation), or about the same number of infective doses for eggs (inoculated into the allantoic cavity). All six strains gave similar results.

W. suggests that this method should be chosen for obtaining psittacosis virus in large quantities, and claims that the fluid is a suitable antigen for complement-fixation tests. He also suggests that because of the extreme sensitivity to small doses of the virus, this should be a suitable method for the primary isolation of the virus.

Attempts to establish two strains of lymphogranuloma inguinale virus in the allantoic cavity were unsuccessful.—N. WICKHAM.

SIGRIST, E. (1943.) Ueber einen Fall von Schweinehüterkrankheit beim Kinde. **[A case of swineherd's disease in a child.]**—*Schweiz. med. Wschr.* **47.** 1402–1403. **1961**

Three young pigs became ill, at intervals of about eight days, with symptoms of encephalitis, but all recovered in 3–4 weeks. Sixteen days after contact with the diseased pigs, a 10-year-old child developed muscular weakness, with high fever, headache, pharyngitis, stomatitis and conjunctivitis. After four days these symptoms subsided, but two days later there was a sudden febrile reaction associated with a lymphocytosis in the cerebrospinal fluid. Recovery was complete in 15 days from the onset of the disease.—J. B. BROOKSBY.

HABEL, K. (1945.) **Cultivation of mumps virus in the developing chick embryo and its application to studies of immunity to mumps in man.**—*Publ. Hlth Rep., Wash.* **60.** 201–212. [Author's summary copied *verbatim*.] **1962**

Mumps virus has been grown in the yolk sac, the amniotic sac, and the allantoic sac of the developing chick embryo. The chick embryo has been shown to be a suitable source of antigen for use in the complement fixation and the diagnostic skin test in man. A virus neutralization test in eggs has been demonstrated. Within the limits of the collodion membrane technique,

the virus has been shown to be greater than 340 mμ in particle size. The mumps virus is quite susceptible to the inactivating effects of heat, formalin, ether, and ultraviolet irradiation. Attempts to isolate virus from saliva of mumps patients employing the chick-embryo technique have failed.

WOOD, H. G., RUSOFF, I. I., & REINER, J. M. (1945.) **Anaerobic glycolysis of the brain in experimental poliomyelitis.**—*J. exp. Med.* **81.** 151–159. [Authors' summary copied *verbatim.*] **1963**

The rate of anaerobic glycolysis of brain tissue was compared for normal animals and animals with experimentally induced poliomyelitis, using two different strains of mice and two different procedures. The report of interference of poliomyelitis with anaerobic glycolysis of brain was not confirmed. In one series there was a small increase and in the other series a small decrease in the brain $Q_{CO_2}^{N_2}$ calculated for infected animals as compared to normal animals. When the calculations were made on the basis of wet weight of brain there was no difference in glycolysis.

It is considered that the methods so far used for study of the enzymes may be inadequate, and that no decision is as yet possible on the effect of poliomyelitis on anaerobic glycolysis.

*MARCZYNOWSKI, O. (1942.) Die Cerato-Conjunctivitis des Rindes im Kreise Dannenberg/Elbe (Reg.-Bez. Lüneburg). [**Kerato-conjunctivitis of cattle in the Dannenberg-Elbe area, Luneburg.**]—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **51.** 13.] **1964**

M. reviews the literature on infectious kerato-conjunctivitis and describes an outbreak of the disease in cattle in the Dannenberg-Elbe area. The disease was prevalent during the summer and autumn of 1941, and though the cause was not definitely established, it is concluded, from a study of the symptoms and course of the outbreak, that it was similar to rickettsial conjunctivitis of sheep, and was probably also a rickettsial infection.—U. F. RICHARDSON.

See also absts. **1968** (diagnosis), **1971** (action of radiations), **1985, 1986** (equine broncho-pneumonia), **1992** (vaccine jaundice), **1998** (rubella), **2059** (influenza).

IMMUNITY

DOLD, H. (1943.) Die Inhibition (Keimvermehrungshemmung) als Abwehrmittel der normalen Schleimhaut gegen Infektion. [**Role of mucous membrane in resistance to bacterial infection.**]—*Z. Hyg. InfektKr.* **124.** 597–605. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **144.** 322.] **1965**

Portions of living and devitalized mucous membrane from a rabbit's trachea were infected with approximately equal amounts of *Chromobacterium prodigiosum* or of *Bacillus anthracis*, and were then incubated for three days in a moist chamber. Preliminary sterility tests had shown the membrane to be free from bacteria. While the devitalized tracheal membrane consistently showed strong growths of *Chromobact. prodigiosum* or of *B. anthracis* after 24 hours, no growth could be detected in the unheated living membrane after this time; after 2–3 days some growth was observed, similar to that seen in the devitalized specimens after 24 hours. From these results, it is concluded that the surface of the living bacteria-free tracheal membrane contains inhibin [see also *V. B.* **14.** 356], which did not kill the inoculated bacteria but prevented their growth; while the inhibitory power of the excised normal tracheal membrane *in vitro* was lost on the death of the membrane, *in vivo* it can be expected to exert a prolonged action.—O. CRUSE.

IPSEN, J. (1944.) **A standard for antistreptolysin O of human serum, and its practical application.**—*Acta path. microbiol. scand.* **21.** 203–213. [In English.] **1966**

It was necessary to prepare a serum standard for antistreptolysin O to replace a diminishing stock of the original rabbit standard of TODD (1932). Since it was found that the antistreptolysin O of human serum and of rabbit serum had different reaction curves it was decided that the standard should be a human serum.

A pooled sample was prepared from three patients with high antistreptolysin titre, diluted 1 : 3 with physiological NaCl solution, and dried in batches of 5 ml. This new standard was compared with the old by an especially accurate method. In each test, the resistance to the lysin of the blood used was determined, as this factor was found to vary from day to day. The readings of haemolysis found in comparative tests were then converted to lysin units. When this was done the form of the curve was constant for each serum from day to day, and the difference between human and rabbit serum was obvious. The ratio of potency of the two standards depends on the degree of reaction or amount of free lysin chosen for the comparison. Details of the technique of assay of antistreptolysin in human sera are given, using the new standard.—J. B. BROOKSBY.

BURNET, ET., & CABASSO, V. (1942.) Recherche d'extraits huileux des bacilles acido-résistants (sur le bacille de Stefansky). [**Investigation of oily extracts of acid-fast bacilli—Stefansky's bacillus.**]—*Arch. Inst. Pasteur Tunis.* **31.** 27–30. **1967**

Stefansky acid-fast bacilli were placed in liquid paraffin, chaulmoogra oil, and olive oil, for periods of 60–70 days at 37°C. Bacteria-free filtrates were then prepared by passing each of the three mixtures through Chamberland L_3 candles, all the material being kept at 50°C. during filtration. G. pigs and rats were inoculated intratesticularly with 0·15–0·75 ml. of these filtrates and killed 60–70 days later. Examination P.M. revealed the presence of small lenticular non-inflammatory patches of acid-fast fatty material on the surface of the liver and peritoneum of all the animals.

—J. LOCHIEL MCGIRR.

SULKIN, S. E., & IZUMI, E. M. (1945.) **An evaluation on in vitro tests in the diagnosis of virus diseases.**—*J. Lab. clin. Med.* **30.** 1–5. **1968**

Comparative tests were made on the value of various serological methods devised to replace virus neutralization tests. The viruses studied were those of equine encephalomyelitis, St. Louis encephalitis, rabies, lymphogranuloma, and influenza A. The most satisfactory results were obtained with complement-fixation methods, which are relatively simple and in most instances run parallel with neutralization tests.

The Goodner collodion-particle test, the Cannon and Marshall collodion-agglutination test and the Roberts and Jones bacterial agglutination method were liable to give false reactions under certain conditions and cannot be recommended as routine procedures, unless the results are confirmed by another method.

—R. E. GLOVER.

FILITTI-WURMSER, S. (1943.) Sur l'oxydation et la réduction du complément. [**Oxidation and reduction of complement.**]—*Rev. brasil. Biol.* **3.** 413–418. [In French: Portuguese summary.] **1969**

Complement contains in addition to active oxidizable groups, at least one active reducible group. The chemical nature of these groups is unknown.

One group inactivated by oxidation may be an –SH group probably existing in a more or less masked form, for complement is not inactivated by certain oxidizing agents such as potassium ferricyanide or the indophenols.

The active reducible group might be an –S–S– linkage, as in insulin. Cysteine and glutathione both inactivate complement. Their reducing action may be on the above reducible group of complement, but there is also the possibility that their effect may be due to inhibition of sensitizing elements on the surface of the red blood cells, or to a possible action on the haemolysin.—ISOBEL W. BROCKLEHURST.

MACLENNAN, J. D. (1944.) **Hyaluronidases in infected wounds.**—*Lancet*. **247.** 433–434. **1970**

Exudates or muscle extracts from 12 cases of gas gangrene were tested for hyaluronidase by the mucin clot-prevention test. Hyaluronidase was only clearly detected in the pus from an empyema due to *Streptococcus pyogenes*. All the other cases had mixed infections with proteolytic species predominating. The value of the test in the differential diagnosis of gas gangrene is therefore doubtful.—E. BOYLAND.

LEA, D., SMITH, K. M., HOLMES, B., & MARKHAM, R. (1944.) **Direct and indirect actions of radiation on viruses and enzymes.**—*Parasitology*. **36.** 110–118. **1971**

The chemical and biological actions of X-rays and radioactive radiations causing inactivation of viruses and enzymes has been studied. Evidence suggests that virus inactivation is due to dissipation of energy, by ionization inside the virus particle itself. A single ionization inside the virus particle causes inactivation. The measurement of the dose of radiation required to inactivate a given virus can be used to distinguish between the 'macromolecular' type of virus such as that of the tobacco mosaic virus and the viruses of more complex structure such as vaccinia, and also to determine the size of the virus of the first type. Using aqueous solutions of purified enzymes, inactivated by X-rays, it has been found that the effect of the radiation is indirect. Energy dissipated in the water by the radiation leads to the inactivation of the enzyme, presumably by an agent formed by ionization of the water, or excitation of the water. The method did not provide an accurate means for finding the molecular weight of the enzyme.

The authors wished to investigate the mechanism of the inactivation by radiation of viruses and enzymes to find if they were fundamentally different. Tobacco mosaic virus at various concentrations was inactivated by exposure to γ-rays. It was found that at high concentrations the inactivation is constant, at low concentrations is constant but lower in value, and over an intermediate range, the inactivation dose increases with the increase in concentration. When used in the dry state or in concentrated solution the γ-rays produced direct inactivation due to inactivation within the virus particle. In dilute solution the inactivation is mainly indirect and is due to ionization of the water. The presence of a substance such as gelatin added to the solution protects the virus against this indirect action.

Purified dried enzymes, ribonuclease and adenylpyrophosphatase (myosin) were given very high doses of X-rays. Results of these experiments have been plotted as curves. Comparing the work on the inactivation of dry enzymes with that on the virus particle where it is considered that a single ionization in the virus particle brings about inactivation; if a single ionization within the enzyme molecule leads to inactivation, then measurement of the inactivation dose of radiation gives a means of finding the approximate molecular weight of the enzyme. From these experiments there appears to be no fundamental difference in the mechanism of radiation-inactivation of viruses and enzymes.—R. M. L.

See also absts. **1926** (fowl cholera vaccination), **1943** (influenza vaccine), **1947** (E.I.A. vaccine), **1956** (rinderpest immunization), **1936** (bovine trichomoniasis intradermal test), **1978, 1979** (nutrition and helminth imminity), **2019, 2020** (ascorbic acid and immunity).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SONI, B. N., & KHAN, M. A. (1944.) **Ox warble-fly in India.**—*Indian Fmg.* **5.** 118–121. **1972**

The Indian hide and skin industry suffers a loss of 15 million rupees annually on account of warble perforations, apart from the loss sustained through reduced milk yield, loss in condition, and spoiled meat in warble-infested animals.

The infestation is mainly restricted to N.W. India, where 50–90% of cattle are affected. *Hypoderma lineatum* lives 10–12 days and is on the wing from March to June. Eggs are laid on the lower portion of the legs of bovines. Larvae hatch out in 3–6 days and burrow into the skin.

For control, the eggs may be destroyed by singeing at 5-day intervals during the egg-laying season. For the grubs in the back, derris-soap wash and tobacco-lime infusion were found effective. During the warble season, four dressings are required at one-month intervals, beginning in October in the plains and in November in the hills.—M. A. KHAN.

WAGNER, O. (1944.) Haut-Dasseln als Erreger des "Biesens" bei Rindern. **[Warble flies as cause of "gadding" in cattle.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 155–156 & 191. **1973**

W. discusses views expressed by various authors as to whether warble flies or biting flies are the cause of "gadding" in cattle. He considers that the evidence incriminates the warble flies as the true cause of "gadding", the egg-laying activities of the female being responsible for the reactions of the cattle. The egg-laying of the female is itself influenced by environmental conditions, particularly atmospheric conditions.

—T. E. GIBSON.

SIMMONS, S. W. (1944.) **Observations on the biology of the stablefly in Florida.**—*J. econ. Ent.* **37.** 680–686. **1974**

S. gives a full account of the development and feeding habits in Florida of the various stages of *Stomoxys calcitrans*. The minimum incubation period of the eggs at 28°C. was 19 hours and the maximum 120 hours, with a calculated arithmetic mean of 52·3 hours. When reared on medium at 30°C., first instars were found from the 1st to the 90th hour, second instars from the 44th to 144th hour, and third instars from the 97th hour onwards. The development period was longer in winter, even when rearing was carried out at summer temperatures. The mean pupal period was 6·55 days at temperatures ranging from 28°–32°C. Adult flies captured in nature and fed on citrated beef blood lived as long as 47 days in captivity, but most of them died before this time. The minimum pre-oviposition period was 8 days, with a mean of 10·6 days.

In feeding, flies often punctured the skin of their host several times before drawing blood, but when

blood was found engorgement was accomplished in 1½–8 min. with a mean of 5 min. Under Florida conditions, the flies feed most readily on human hosts early in the morning and late in the afternoon, and are sluggish during the hottest part of the afternoon.

The cycle from egg to adult may be as short as 13 days, or may, under adverse temperature conditions, require several months.

"Bay grass" freshly washed ashore by the tide is the most suitable material for oviposition and development. If the deposit loses its green colour before being exposed to oviposition the emergence of flies drops to a very low number, ceasing altogether after 21 days.

—W. MOORE.

—. (1941.) Tret'e soveshchanie po parazitologicheskim problemam. **[Report of the discussion at the third All-Union meeting on parasitological problems, held in Moscow, March 1941.]**—*Veterinarya, Moscow.* No. 3. pp. 134–140. **1975**

This is a report on a joint meeting of members of the biological, medical, and veterinary professions organized by the Soviet Academy of Science, the All-Union Institute for Experimental Medicine, and the All-Union Institute for Experimental Veterinary Medicine, which was devoted to the biology, ecology, and eradication of ticks, and their role in the transmission of disease in human beings and animals. There were 30 reports by prominent Soviet arachnologists. Of special interest for veterinarians were papers on the relation between piroplasms and ticks, on the geographical distribution of ticks in several republics of the U.S.S.R., and on the control and eradication of ticks.

PETROV referred to the development of *Babesia bovis* in *Ixodes ricinus*. He developed a method which enabled the salivary gland of the tick to be examined *in toto*. SUDACHENKOV reported the results of experiments made on 79 bovine animals on transmission of babesia by *I. ricinus* and *I. persulcatus*. Based on his findings, he emphasizes that whole areas can be cleared of the disease by destruction of imaginal stages of ticks on infested cattle. MARKOV found that *Haemaphysalis otophila* could transmit ovine piroplasmosis. He also reported on the survival of *B. ovis* in seven generations of *Rhipicephalus bursa* which were fed on animals insusceptible to *B. ovis* infection. In his opinion prophylactic measures consisting of interchange of animals of the different species on the pastures is not effective. KORNEEV found *H. punctata* responsible for the transmission of *Babesia bigemina* in Voronezh province. MARCHENKO observed that *Dermacentor* ticks became free of infection in succeeding generations when fed on infected horses which were treated with trypanblue. BOGORODITSKIĬ referred to a strain of *Theileria* in which gametocytes do not develop. It is suggested that infection with this strain may confer immunity to reinfection with the normal gametocyte-producing strain, and thus prevent further infection in and spread by ticks.

LOTOTSKIĬ found in Tadzhikistan 19 species of *Ixodes* which infest 39 different species of domestic and wild animals. OLENEV dealt with the distribution of *I. ricinus* and *I. persulcatus* in north-western provinces of the U.S.S.R. SVIRSKAYA found ticks of the genera *Dermacentor*, *Hyalomma*, and *Ixodes* among 7,000 domestic and 700 wild animals in 280 districts of Mongolia. *Ixodes* spp. were found only on wild animals. *D. nuttallii* was found to be responsible for transmission of equine piroplasmosis. She made also various observations on the development of *D. nuttallii* under natural and laboratory conditions. TSELISHCHEVA investigated 119 districts in Kazakhstan and found 28 species of *Ixodes* and six of *Argas*. *R. bursa* was not found, which is considered to account for the absence of sheep piroplasmosis. GALUSO dealt with the bio-ecological characters of ticks in Kazakhstan, and recommended various control measures such as improvement of pastures, drainage, changes of pastures, and systematic measures for interruption of the life-cycle of the ticks. ORLOV referred to the adaptation of *D. silvarum* to the conditions of open dry plains and moist woodland. Examination of 13,000 living wild animals revealed 33 species as hosts for *D. silvarum*. In addition to control measures directed against the ticks, he recommends rodent control, development of the fur-hunting trade, prohibition of forest pasturing, and preservation of certain birds of prey and carnivorous wild animals. SUDACHENKOV investigated the distribution of ticks in Leningrad province and discussed the influence of climate, moisture, fluctuation of day and night temperatures, and interdependency between vegetation and tick incidence.

PAVLOVSKIĬ, GALUSO & LOTOTSKIĬ referred to various methods of control of *Boophilus calcaratus*, *Hyalomma anatolicum* and *H. detritum* in Tadzhikistan, consisting in the destruction of larvae, nymphs, and imagoes on animals, improvements in agriculture, and prophylactic chemical treatment of susceptible animals. They claim that the application of these measures lowered to one twenty-seventh the incidence of *B. calcaratus* and *H. anatolicum*. CHIZH referred to prophylactic sodium arsenite dressings for the control of piroplasmosis in Leningrad province, by the use of which the incidence was reduced by 44–58%. KURCHATOV referred to pyrethrum as an insecticide. Mature *Ixodes* ticks were the most resistant. NIKOL'SKIĬ found arsenic dressings effective against *B. calcaratus*, but less effective against *D. silvarum*, since the latter occurs in early spring and late autumn when dipping is impracticable. DEGTYAREV dealt with *Dermacentor* as a transmitter of equine piroplasmosis in Western Siberia. Arsenic dressings were found ineffective. POGORELYĬ investigated seven species of *Ixodes* ticks in the Ukraine. He found that equine piroplasmosis may be transmitted by *Dermacentor* ticks and their nymphs. Arsenic dressings were not always practicable because of climatic conditions. Good therapeutic and prophylactic results were obtained with trypanblue.

There was also a wide discussion. Several decisions were made regarding research, and recommendations were made on further improvements in practical methods for the control of ticks, on transmission of equine infectious anaemia, equine encephalomyelitis, tularaemia and brucellosis, and on the prophylaxis of equine piroplasmosis.—A. MOLDAWSKY.

BISHOPP, F. C., & TREMBLEY, H. L. (1945.) **Distribution and hosts of certain North American ticks.**—*J. Parasit.* **31.** 1–54. **1976**

A very comprehensive account of the geographical and seasonal distribution and of the host relationships of ticks found in North America. Very useful host lists and maps showing distribution in the U.S.A. are given for each of the most important species from information based on the records and collections of ticks made during the past 35 years by the Bureau of Entomology (later the Bureau of Entomology and Plant Quarantine) of the U.S. Department of Agriculture.

Although the article deals particularly with the North American species there is much of interest to workers in other parts of the world. Among many points of special veterinary interest are the following:—*Argas miniatus* shows a predilection for arid conditions and has spread considerably during the past 40 years in the southern states of the U.S.A. *Dermacentor occident-*

alis and *D. variabilis* have been shown experimentally to be capable of transmitting anaplasmosis of cattle. Losses are said to have been observed in turkeys as a result of heavy infestation with *Haemaphysalis chordeilis*, a tick usually found only on wild birds. *Ixodes brunneus*, a species found on wild birds which has been reported from England, Italy, France and Nyasaland as well as from the U.S.A., is of interest because although it is unusual to find more than a very few specimens on any one host, the small numbers present seem to have a very adverse effect on the host. Birds with only one engorged specimen attached in the head or neck region are found dead or unable to fly. It is suggested that these effects may be due to a toxin introduced by the tick. [The condition seems to resemble " tick paralysis " as reported in man and domestic animals in Australia and Canada.] The habit of *Ornithodorus megnini*, the " spinose ear tick ", of attaching deep in the external ear, the long period up to seven months during which larvae and nymphs remain attached, and the fact that adults take no food, permit this pest to be transported long distances from its original habitat. Its transport to South Africa by shipments of horses and mules is quoted as an example. [It has also been introduced into India in the same way (Sen—*V. B.* **8.** 441).] It is stated that this tick never becomes established in humid regions. Although *Rhipicephalus sanguineus*, the common dog tick, occurs in the warmer parts of the world it can become established in heated dwelling houses in colder areas. It is stated that *R. sanguineus* transmits anaplasmosis in cattle and dogs. [No authority is quoted in support of the statement that anaplasmosis in dogs is transmitted by this tick. There is doubt as to whether this disease occurs in dogs.]

A useful list is given of the common and scientific names of host animals and birds.—M. C.

See also absts. **1947** (vectors of E.I.A.), **2060-2062** (insecticides), **2106** (arthropod parasites in Panama).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

*WETZEL, R. (1943.) Die Finnen des Wildes und der Fleischbeschauer. **[Cysticercosis of wild animals and meat inspection.]**—*Rdsch. Fleischbesch.* **44.** 25–29. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 132.] **1977**

A number of suggestions are made for controlling the spread of cysticerci by wild species :– (1) the organs of wild animals affected with cysticerci should be carefully disposed of, preferably by burning ; (2) dogs should not be fed with the viscera or other parts of infested animals, and in particular rabbits and hares should not be fed to dogs ; (3) infected parts of wild or domestic animals should not be used as bait for traps ; (4) hunting dogs should be subjected to anthelmintic treatment from time to time ; (5) the shooting of dogs which have gone wild should be carried out ; (6) all carrion should be destroyed as soon as possible ; (7) to prevent infection in man, familiar contact with dogs (*e.g.*, kissing and licking the hands) should be avoided.—T. E. GIBSON.

WATT, J. Y. C. (1944.) **The influence of vitamins B_1 (thiamine) and B_2 (riboflavin) upon the resistance of rats to infection with *Nippostrongylus muris*.**—*Amer. J. Hyg.* **39.** 145–151. **1978**

Investigations were carried out on the influence of diets (a) partially deficient in vitamin B_1 and (b) completely deficient in vitamin B_2, both being otherwise adequate, on the resistance of rats to infection with *N. muris*. The criteria of resistance were (1) the number of *N. muris* remaining in the intestines of the animals of the various groups 12–14 days after infection with known numbers of larvae, (2) the distribution of the worms in the lungs as well as in the intestines, and (3) the effect of the deficiencies on the immunological potency of the plasma in the passive transfer of immunity. From 4–10 animals were used in each of the experimental and control groups.

The following results were obtained. (1) Deficiency of vitamin B_1 lowered the resistance of young rats to some degree to a primary infestation with *N. muris*. (2) When young rats were fed a diet deficient in vitamin B_2 for 40 days and were then given 2,500 *N. muris* larvae, 8 of the 10 animals on the deficient diet died within 12 days of infestation, whereas all the controls survived on a complete basal diet. (3) Deficiency of B_1 and B_2 respectively in two groups reduced the resistance of the animals to a superinfestation with *N. muris*. (4) Passive transfer of immunity from hyperimmunized animals fed the two deficient diets was less effective than the immunity conferred by plasma of the control animals fed adequate diets. (5) When a vitamin B_1 deficient diet was fed to animals which had a high degree of specific resistance after serial immunization, this specific resistance was markedly reduced.

From these results it is concluded that a diet deficient in either thiamine or riboflavin reduces the resistance of rats to infestation with *N. muris*.—R. A.

MAYHEW, R. L. (1945.) **Studies on bovine gastro-intestinal parasites VIII. Effects of a low plane of nutrition on immunity to the stomach worm Haemonchus contortus.**—*Amer. J. vet. Res.* **6.** 21–27. [For part VII, see *V. B.* **15.** 191.] **1979**

MAYHEW, R. L. (1944.) **Studies on bovine gastro-intestinal parasites IX. The effects of nematode infections during the larval period.**—*Cornell Vet.* **34.** 299–307. **1980**

VIII. Immunity was established in six calves by one or more (up to six) series of inoculations with infective *H. contortus* larvae. When a decrease in faecal egg count showed that immunity had been established the calves were placed on a diet of cottonseed hulls. In a variable time after feeding began, a test inoculation of larvae was given to each of the animals. In three of the animals there was a slight increase in egg counts, but in the other three there was no such increase. Several non-immune calves given similar doses of larvae, developed heavy infestations as shown by their faecal counts. There appeared, therefore, to be no significant lowering of resistance of the immune calves as a result of the poor diet.

IX. After reviewing the literature on the effect of nematode infestation during the prepatent period, M. goes on to record observations made on 12 calves which were experimentally infected with *H. contortus* and other nematode larvae, the animals having been raised under parasite-free conditions before being used in the experiment. It was found that gain in weight was much reduced during the prepatent period of the infestation but that regular increase continued again after the worms had reached maturity. Six calves died during the experiment and on the results of P.M. examination, their deaths were attributed to the effects of the parasites during the prepatent period. M. points out that it is not generally recognized that damage is done during the prepatent period, and emphasizes the fact that the severe anaemia which develops during the prepatent period may lower the resistance of the animal to other diseases such as pneumonia.—T. E. GIBSON.

*ROMBOLI, B. (1942.) Su di una grave infestione da trichostrongylidi nei fagiani. **[Infestation of pheasants with trichostrongyles.]**—*Riv. ital. Igiene.* **2.** 560–574. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 133.] **1981**

In a game preserve a severe, often fatal, disease of pheasants occurred with symptoms of emaciation, anaemia, failure of the blood to clot, and subcutaneous oedema. The contents of the small intestine and caecum were caseous; there was reddening and catarrh of the mucosa and there were large patches of pseudomembranes. Destruction of the villi had taken place and the pseudomembranes were probably composed of fibrin and cell debris from the oedematous, necrotic epithelium. In the glandular layer of the intestinal wall, large numbers of *Trichostrongylus tenuis* were found, the disease being apparently due to the migration of these parasites in the intestinal wall.—T. E. GIBSON.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

*TROCH, P. (1942.) Über die Verteilung von kolloidalem Platin im Körper der Tumorratte nach intravenöser Injektion von Peteosthor. **[Distribution of colloidal platinum in the bodies of tumour-bearing rats after intravenous injection of "peteosthor".]** —*Mschr. Krebsbekämpf.* **10.** 157–160. [Abst. from abst. in *Zbl. Bakt. I. (Ref.).* **144.** 476.] **1982**

On the intravenous injection of "peteosthor", colloidal platinum is irregularly distributed in the tissues of tumour-bearing rats. There is some accumulation of platinum in the tumour but the highest concentration is found in the Kupffer cells of the liver and reticular cells of the spleen.—E. BOYLAND.

SANDERS, E., HUDDLESON, I. F., & SCHAIBLE, P. J. (1944.) **An electrophoretic study of serum and plasma from normal and leucosis-affected chickens.** —*J. biol. Chem.* **155.** 469–481. **1983**

The authors subjected to electrophoretic analysis the serum and plasma proteins of single-combed White Leghorn chickens 15–18 weeks old, using normal birds, birds showing various manifestations of the avian leucosis complex (neurolymphomatosis, visceral lymphomatosis, osteopetrotic lymphomatosis, and erythrogranuloblastosis), and birds artificially infected with a transmissible lymphoid tumour (strain "R.P.L.12" of the B.A.I. Regional Poultry Research Laboratory).

A comparison of the relative composition of sera from leucosis-affected and normal birds indicated that the disease complex resulted in the appearance of a new protein fraction (designated the L component) related to the γ-globulin, a decrease in albumin, and an increase in α-globulin. No significant differences were found to distinguish the electrophoretic patterns of sera from the different types of leucosis. In the case of the artificially infected birds the L component appeared as early as the third day after infection; in birds infected with the tumour agent after it had been inactivated by twice-repeated freezing to −76°C. and thawing, the L component could be demonstrated but not until the 15th day after injection.

Attempts to separate the new component from γ-globulin by a sodium sulphate salting-out method were unsuccessful.—J. LOCHIEL MCGIRR.

See also abst. **1994** (oestrogen-produced fibromas).

DISEASES, GENERAL

LAMBRECHTS, M. C. (1944.) **The health of animals in the Transkei.**—*S. Afr. med. J.* **18.** 136–139. **1984**

The diseases occurring in the Transkei are essentially the same as those in other parts of the country but some are more prevalent owing to the climatic conditions. Sheep scab has been eradicated and there have been only two active outbreaks of East Coast fever. Anthrax has been almost controlled; in 1936 there were 177 deaths from the disease but in 1943 there were only seven. This decrease is due to annual block inoculations of all cattle. TB. is rare in cattle but in pigs seems to be fairly common.

Poisonous plants are widely distributed, the commonest being *Senecio* spp. Owing to overstocking the worst problem is undernutrition, so that even minor droughts cause heavy mortality in stock. The annual losses in cattle from starvation and exposure varied from 70,000 to 120,000 over a period of ten years.

A description is given of the methods by which stock diseases in the Transkei are controlled.—E. M. R.

EBERBECK, E., & HEMMERT-HALSWICK, A. (1943.) Jahresbericht über die im Jahre 1940 im Heeres-Veterinäruntersuchungsamt ausgeführten pathologisch-anatomischen und -histologischen Untersuchungen. **[Report on pathological and histopathological investigations at the German Army Veterinary Research Laboratory in 1940.]**—*Arch. wiss. prakt. Tierheilk.* **78.** 326–333. **1985**

The following conditions are reported. The most serious disease of horses in the present war has been infectious catarrh of the respiratory tract (infectious broncho-pneumonia, Brussels disease) and its complications and sequelae. This disease, therefore, received most attention during 1940 from the German Army veterinary research personnel. Material was examined from 52 animals with lesions directly attributable to streptococcal infection, and from a further 87 in which the lesions were probably due to either infectious catarrh or strangles; a summary of the main findings is given [see also *V. B.* **12.** 580].

Material from 185 horses was examined for infectious anaemia and autopsies were made on 11 animals, with negative results; examination of material from 81 horses and autopsies on 25 animals revealed the disease. Glanders was not a serious disease, but small outbreaks originating from French horses (all Berber animals) provided 72 cases. A large number of other conditions are listed, including 29 cases of colic.

Diseases in Army dogs included distemper (16 cases), and infectious icterus (3 cases). In pigeons there were 6 cases of pox, 6 of infections with *Salmonella typhi-murium*, and 2 of trichomoniasis. A number of fowls belonging to civilians were poisoned by consuming the fluid used as "anti-freeze" ("Glysantin"—a mixture of glycols and glycol esters). The toxicity of "Glysantin" for fowls was verified by experimental work, the lesions being a mild enteritis and degenerative changes in the kidneys. Pigeons and geese were more resistant.—E. G. WHITE.

EBERBECK, E., & HEMMERT-HALSWICK, A. (1943.) Zur Pathogenese der Spätschäden des ansteckenden Katarrhs der Luftwege bzw. der Druse des Pferdes. **[Pathogenesis of the sequelae of equine infectious bronchitis and strangles.]**—*Arch. wiss. prakt. Tierheilk.* **78.** 334–351. **1986**

An exhaustive study over a period of three years of the clinical symptoms and, when possible, the pathological anatomy of Army horses under constant veterinary supervision has led the authors to conclude that many of the sequelae of strangles and equine infectious bronchitis are of an allergic nature. A state of immunity develops after these infections and any reinfection gives rise to an antigen-antibody reaction. In certain individual animals this reaction may be severe and lead to swelling of the endothelial cells with increased permeability of the capillaries. These changes develop into what the authors have defined as a "sero-productive inflammation". The sequelae that they class in this group include purpura haemorrhagica, diffuse glomerulonephritis, vascular and cardiac changes, liver changes, internal hydrocephalus, neuritis of the cauda equina and laminitis. [See also *V. B.* **11.** 39.]—W. M. H.

FOURIE, P. J. J. (1943.) **Genetics in the diagnosis of bovine congenital porphyrinuria (pink tooth).**—*Onderstepoort J. vet. Sci.* **18.** 305–310. **1987**

F. records the examination P.M. of a bull which showed the type of photosensitization seen in cattle with "pink tooth". The bull had a daily porphyrin excretion slightly above normal but showed no evidence ot "pink tooth" itselr. It had a common though remote relationship to a bull which was shown to be the possible transmitter of the porphyrin-carrying gene to a Shorthorn herd. The bull died of heartwater and at the P.M. examination no discoloration of the teeth, bones or urine was found. The findings as regards porphyrins in the organs led F. to conclude that although the bull had shown photosensitization since birth, it was not a genuine case of porphyrinuria.—E. M. R.

BENNETTS, H. W. (1944.) **Two sheep problems on subterranean clover dominant pastures. 1.—Lambing trouble (dystokia) in merinos. 2.—Prolapse of the womb (inversion of the uterus).**—*J. Agric. W. Aust.* **21.** 104–109. **1988**

Dystokia in merino ewes and inversion of the uterus affecting merino and other breeds have assumed serious economic importance in Western Australia since 1941. The three years during which the diseases have been prominent have had very favourable seasonal conditions and the diseases have occurred only where early subterranean clover dominates the pasture.

In the dystokia syndrome the ewes give no normal signs of lambing and the full-term lamb is eventually born dead.

Inversion of the uterus is delayed for several months after the lambing season. Even unbred ewe lambs are susceptible to such inversion.

Apparently neither disease is due to an infectious agent. In the light of the possible importance of large amounts of subterranean clover in the diet and until the aetiological factors are determined, B. recommends as immediate practical prophylactic measures, the feeding of dry cereal hay, grazing on unimproved pasture and other measures calculated to balance the clover with other herbage.—D. C. BLOOD.

PARKIN, B. S. (1944.) **Eosinophilia in a dog. (Case report.)**—*J. S. Afr. vet. med. Ass.* **15.** 6–7. **1989**

A case is described of a dog showing marked and continuous expiratory dyspnoea, intermittent and paroxysmal coughing and loss of condition. Examination of the blood showed numerous eosinophiles. TB. and worm infestation were excluded. Feeding heavily on a maize, meat and milk diet, resulted in apparent recovery in about two months. Six months later a certain degree of eosinophilia was still present but the dog did not appear ill.—E. M. ROBINSON.

POLLAK, O. J. (1945.) **Attempts to produce cerebral atherosclerosis.**—*Arch. Path.* **39.** 16–21. [Author's conclusions copied *verbatim.*] **1990**

Atherosclerosis generalized except for the cerebral vessels developed in cholesterol-fed rabbits. Control animals, not fed cholesterol, did not show atherosclerosis. Ligations of both carotid arteries, of both jugular veins or of one artery and one vein were followed by changes in the cerebral vessels in both the cholesterol-fed and the control animals. These changes were not atherosclerotic but hypertensive. Injections of epinephrine hydrochloride and of histamine phosphate had no visible effect on the cerebral vessels nor did they alter the changes which were due to ligations of vessels. They did not influence the atherosclerotic lesions in any way.

POLLAK, O. J. (1945.) **Correlation between chemical and morphologic alterations in experimental atherosclerosis.**—*Arch. Path.* **39.** 11–15. [Author's conclusions copied *verbatim.*] **1991**

Feeding of cholesterol to rabbits causes temporary or permanent hypercholesteremia of a varying degree. The type of reaction depends on the individual ability to metabolize cholesterol. The more cholesterol ingested the greater is the probability of hypercholesteremia. Hypercholesteremia is not necessarily followed by atherosclerosis, as the threshold for cholesterol of the rabbits differs from one animal to another. The higher the blood cholesterol value the more likely it is that atherosclerosis will develop. Once the defensive mechanism is broken and atherosclerosis develops, the degree and the extensiveness of the process will increase with the rise of the blood cholesterol level.

CARLE, B. N., DEWHIRST, W. H., Jr., BRAUN, W., & EATON, M. D. (1944.) **Experiments on the transmission of an icterogenic agent in yellow fever vaccine to horses and swine.**—*J. Bact.* **48.** 45–69. **1992**

Attempts to transmit the icterogenic agent to pigs were unsuccessful. Four out of six horses inoculated with yellow fever vaccine known to be icterogenic for man and two out of five horses inoculated with material from human cases of jaundice resulting from yellow fever vaccination, did not show any clinical evidence of jaundice, but developed increases in icteric index and serum bilirubin level 2–4 months after inoculation. No such changes were observed in control horses. Passage attempts in horses were unsuccessful but it is considered that the species may be slightly susceptible to the icterogenic agent in yellow fever vaccine.

—A. N. WORDEN.

ROGOFF, J. M. (1944.) **Experimental pathology and physiology of the adrenal cortex. Production of Addison's disease in laboratory animals.**—*Arch. Path.* **38.** 392–409. [Author's summary copied *verbatim.*] **1993**

The production of experimental Addison's disease has been accomplished in cats and dogs by subtotal vascular occlusion of the adrenal glands, which induced chronic and subacute as well as acute adrenal insufficiency. The same process may occur in human beings, inducing Addison's disease as an accidental consequence of surgical denervation or partial ablation of the adrenal glands practised as a therapeutic procedure. Manipu-

lation of the adrenal glands can easily cause vascular thrombosis and occlusion.

In the experimental animals the procedure usually led to anemic infarction, degeneration and necrosis of the gland, with regeneration, fibrosis and atrophy, comparable or identical with the pathologic changes designated as "cytotoxic atrophy" of the adrenal glands often encountered in human Addison's disease. Selective degeneration of the cortex, leaving the medulla intact, was readily produced in a large number of the experimental animals.

The clinical manifestations, the chemical changes in the blood and other manifestations of adrenal insufficiency produced in the animals were the same in general as occur in Addison's disease and, more severely, in adrenalectomized animals. The most characteristic of the blood changes is an increase in the "undetermined fraction" of the nonprotein nitrogen. Congestion of the pancreas commonly occurs in the subacute and the acute stage of adrenal cortical insufficiency. Experimental chronic and subacute adrenal insufficiency is usually associated with enlargement of the parathyroid glands; this is of interest in relation to the increase in total serum calcium that occurs.

When degeneration exceeded regeneration, acute crises, often death, resulted. Recovery ensued if regeneration was more active than degeneration, the necrotic portion of the gland being replaced by fibrous tissue; sometimes calcification occurred.

These experiments constitute a method for fundamental investigations of the adrenal cortex from the standpoints of physiology and pathology.

VARGAS, L. (h). (1942.) Fibrosis diseminada peritoneal inducida en el cobayo por estrogenos. **[Disseminated peritoneal fibrosis, induced in g. pigs by the administration of oestrogens.]**—*Rev. Chile. Hig. Med. prev.* **4.** 265–276. [English summary.] **1994**

Oestrogens injected into entire or castrated g. pigs produce, in addition to characteristic fibromas, localized patches of fibrosis and fibrous strands resembling postoperative adhesions, as well as diffuse fibrosis of the parietal and visceral peritoneum. The latter tends to lose its normal smooth transparency and to become rough and whitish in colour. The fibrosis tends to localize in definite areas of the abdominal cavity, corresponding to the usual sites of fibroma formation.

Histological examination of the fibrous tissue shows a lack of cellular elements, and a preponderance of collagen fibres, the disposition of the latter being more orderly than in the fibroma.—ISOBEL W. BROCKLEHURST.

MENKIN, V. (1944.) **Non-antigenic property of the leukocytosis-promoting factor of inflammatory exudates.**—*Proc. Soc. exp. Biol., N.Y.* **56.** 219–220. **1995**

The possibility of the clinical application of the leucocytosis-promoting factor (L.P.F.), obtained by the purification and fractionation of exudative material, led M. to investigate this active material in order to determine whether it is antigenic.

Repeated subcutaneous injections were given to rabbits at intervals of six days for a period of 4–5 weeks. These injections induced no appreciable local reaction. Observations made on g. pigs with L.P.F. from dog exudates showed that no anaphylactic manifestation followed a second dose given one month later; a dog exhibited no anaphylactic reaction on being injected at varying intervals with L.P.F. of human origin.

M. concludes that the L.P.F. of inflammatory exudates is essentially non-antigenic.—J. G. CAMPBELL.

MENKIN, V. (1945.) **Chemical basis of fever with inflammation.**—*Arch. Path.* **39.** 28–36. [Author's summary copied *verbatim.*] **1996**

A pyrogenic factor is associated with the euglobulin fraction of inflammatory exudate. To a large extent it can be dissociated from necrosin, a toxic material, which in turn either is a euglobulin or is at least a substance closely linked with that protein fraction of exudate. The dissociation of the pyrogenic factor from necrosin is accomplished by differential solubility. Necrosin is soluble in water containing sulfate ions, whereas pyrogenic factor fails to be appreciably dissolved in the presence of such ions. The pyrogenic factor is termed, for the sake of convenience, *pyrexin.* Its exact chemical nature is still problematic. It appears to be a hydrolytic product brought about by the action either of necrosin or of proteolytic enzymes associated with the latter. Pyrexin is nondiffusible, and it is heat stable. Its nitrogen and phosphorus concentrations are about 11 and 1 per cent, respectively. Pyrexin is essentially absent in normal non-hemolyzed blood serum, but it is present to some extent in hemolyzed serum and also in the serum of an animal with a concomitant inflammation. In experiments on dogs a pyrogenic factor was recovered in increasing amounts from urine with progress of an inflammatory reaction in the pleural cavity. The evidence suggests that one is dealing with pyrexin, which is eliminated at least in part in the urine. Pyrexin offers a reasonable explanation for the primary mechanism of the fever frequently accompanying inflammation. Preliminary indirect studies suggest that its mode of action may possibly be via the hypothalamic heat-regulating centers.

TROLL, M. M. (1944.) **Aberrant pancreatic and gastric tissue in the intestinal tract.**—*Arch. Path.* **38.** 375–380. [Author's summary copied *verbatim.*] **1997**

In 3 of 8 [human] cases of ectopic tissue described, this tissue was pancreatic tissue; in 2 of these cases it occurred in Meckel's diverticulum, and in 1, the ileum. Gastric mucosa was observed in Meckel's diverticulum six times. In 1 case in the series Meckel's diverticulum contained both types of tissue. The 2 instances of aberrant pancreas in Meckel's diverticulum are the twenty-fourth and twenty-fifth cases to be reported. The case of pancreatic tissue in the ileum makes the twenty-first in the literature. Of the three theories on the pathogenesis of the aberrant pancreas and gastric mucosa, the theory that the tissue was transplanted from the original site during embryonic development is believed to be the most acceptable.

EVANS, M. W. (1944.) **Congenital dental defects in infants subsequent to maternal rubella during pregnancy.**—*Med. J. Aust.* Sept. 2nd. 225–228. **1998**

23 out of 34 babies whose mothers had had German measles during pregnancy showed congenital dental abnormalities. In 21 of these cases rubella had been contracted in the first three months of pregnancy. In every case except two there were associated congenital defects, including deaf mutism, heart disease and cataract.

The dental defects were most severe in cases where the mother had suffered from German measles between the sixth and ninth week of pregnancy (the critical period of dental development) and included retardation of eruption, hypoplasia of the enamel and dental caries.

—D. C. BLOOD.

See also abst. **2085** (liver diseases), **2096, 2097** (livestock diseases in Trinidad and Tobago), **2098-2101** (in St. Lucia), **2102-2105** (livestock losses in the U.S.A.), **2090** (teratology).

NUTRITIONAL AND METABOLIC DISORDERS

BUER, A. W. (1944.) Om en hyppig forekommende antagelig kombinert mangelsykdom og intoksikasjon hos rev. **[A common disease of foxes—combined deficiency disease and intoxication.]**—*Norsk Vet-Tidsskr.* **56.** 292–305. [English & German summaries.] **1999**

Since the beginning of the war B. has observed many cases of a peculiar disease in foxes sent for P.M. examination. There were 118 cases in 1942–43 and 68 cases in the next year all characterized by haemorrhagic lesions. Cases were most numerous from November to January.

The foxes were usually well nourished. The abdominal and thoracic cavities contained a little bloody fluid; the gastro-intestinal contents were scanty and also blood stained. The liver was pale yellow to dark orange and slightly swollen and where there was blood in the abdomen there were also numerous small haemorrhages through the capsule. The kidneys were yellowish with subcapsular petechiae. In 28 cases the urinary bladder contents were coagulated and bloody. A minority of all cases was jaundiced. In nearly all cases the lungs showed miliary dark-red spots and the lung tissue was infiltrated so that it sank in water.

Histological examination revealed a state of toxic inflammation and fatty degeneration of the liver and kidneys. Bacteriological diagnostic tests were negative and no chemical evidence of poisoning was obtained.

The next step in investigation was the sending of a questionnaire to the owners of the dead foxes. Forty replies reported that the foxes had usually refused food for some days before death and a minor proportion had had convulsions. Some had travelled shortly beforehand. Descriptions of the diet were obtained from 17 fox farms: these are given, together with an analysis on protein, carbohydrate, fat and ash content. Nearly all the diets contained herring, in some cases rancid, and the carbohydrate content tended to be low.

Owners were advised to reduce the fish content, to give vitamin B and carbohydrate and to add milk if possible. After two months the farmers were again questioned and 34 replied. Some had taken the advice fully, some had merely added vitamin B and a few had made no change. Deaths of foxes were reduced.—J. E.

MCGINNIS, J., NORRIS, L. C., & HEUSER, G. F. (1944.) **Influence of diet on chick growth-promoting and antiperotic properties of betaine, methionine and choline.**—*Proc. Soc. exp. Biol., N.Y.* **56.** 197–200. **2000**

Choline as such is required for growth and for the prevention of perosis. Betaine and methionine when added to a simplified diet enabled the chick to synthesize choline. Unidentified factors present in the various simplified diets used exerted an effect on the response obtained with the three substances.

—E. M. CRUICKSHANK.

GERICKE, A. M. (1944.) **Choline and nicotinic acid in poultry rations.**—*Fmg S. Afr.* **19.** 331–336 & 339. **2001**

In the prevention of perosis or slipped tendon in chickens both choline and nicotinic acid appear to be necessary in the diet. In experiments conducted by G., the substitution of maize meal for wheat bran resulted in cases of dermatitis. In experiments to find the optimum choline and nicotinic acid quantities in the diet of poultry it was found that good results can be obtained with practical chicken rations if the choline content varies from 90–130 mg. and the nicotinic acid content from 6–8 mg. per 100 g. of feed.

In comparing two rations for egg production it was found that better results were obtained with one containing 94 mg. of choline and 3·2 mg. of nicotinic acid than one with 68 mg. of choline and 6·8 mg. of nicotinic acid per 100 g. of the ration.—E. M. ROBINSON.

NIELSEN, A. L. (1942.) Perosis en Knoglesygdom hos Høns. **[Perosis, a bone disease of fowls.]** pp. 144. Copenhagen: Arnold Busck. 4to. [English & German summaries.] **2002**

N. reviews the literature on perosis and describes experiments carried out in connexion with its aetiology. Previous workers had established that perosis occurs in fowls, geese, turkeys and pheasants, is more common in males than in females and occurs chiefly in fast-growing chicks of 2–3 weeks of age. Few birds over six weeks old become affected. The characteristic lesion is luxation of the flexor tendon at the hock joint, lateral luxation being most frequent but medial luxation occasionally occurring. The leg is bent and lame.

In experimental work on White Leghorn chicks, N. found that the following diet produced perosis in 97 out of 104 chicks fed on it for six weeks:—casein 40 parts, cane sugar 40, dried lucerne 5, yeast 10, marmite 2·27, cod liver oil 5, wheat germ oil 1, and a salt mixture 5. The salt mixture consisted of $CaCO_3$ 2,200 parts, $Ca_3(PO_4)_2$ 2,374, MgO 250, ferric citrate ("1·5 aq") 175 and KI 1. The Ca : P content of this diet was 2·1% : 1·2%, the manganese content 0·54 mg. per 100 g. and the protein content 37·6%. In a study of factors which when added to this diet would prevent perosis N. found that rice bran, which contains about 10 mg. Mn per 100 g., was partially protective, that Mn as the permanganate was also protective to a great extent, though not completely, and that Mn plus choline was completely protective when added in amounts of 200 mg. Mn and 2 g. choline per kg. of the above diet. He also found that the injection of $MnSO_4$ solution [dose not clear] into the air sac of incubating eggs resulted in the hatching of chicks with normal bone. [Only one group hatched of the controls injected with saline or untreated, so that this observation is of limited interest.]

In investigations into the biochemistry of perotic chicks, no abnormality in plasma calcium or inorganic phosphorus was found, nor was the bone ash content abnormal. Much work was done on the plasma phosphatase but no useful lead towards an understanding of the chemical pathogenesis was obtained thereby.

Ordinary and X-ray photographs showed that the length of the femur and tibia is decreased in chicks with perosis and that the process of ossification is retarded. This subnormal bone growth is the essential lesion and the fundamental cause of dislocation of the tendon. Many histological sections illustrating the condition are shown. These new research data should be examined in the original by poultry pathologists.—J. E.

STOERK, H. C., & CARNES, W. H. (1945.) **The relation of the dietary Ca : P ratio to serum Ca and to parathyroid volume.**—*J. Nutrit.* **29.** 43–50. **2003**

Ten-week-old male albino rats were fed for four weeks on a diet containing 2·0–0·015% Ca and 1·2–0·07% P, the Ca : P ratios thus obtained varying from 1 : 15–1 : 0·032. The animals were then bled from the right auricle under ether anaesthesia and the serum Ca and P determined. The parathyroid glands were fixed, embedded and serially sectioned at 10μ, their volumes being determined by tracings and planimeter readings.

A high dietary Ca : P ratio gave very small glands and mild hypercalcaemia, while a low Ca : P ratio gave large glands and moderate hypocalcaemia, these effects being independent of the absolute quantity of Ca and P in the diet. The serum phosphate level depended on

both the dietary Ca : P ratio and the absolute quantity of dietary P up to a certain maximal level of serum PO_4. The latter does not bear a simple inverse relationship to the serum Ca level. Under the conditions of the experiment no close inverse proportionality was found between the parathyroid volume and serum PO_4 level, although such a relationship is closely adhered to in the case of parathyroid volume and serum Ca.—A. B. P.

GREENBERG, D. M. (1945.) **Studies in mineral metabolism with the aid of artificial radioactive isotopes. VIII. Tracer experiments with radioactive calcium and strontium on the mechanism of vitamin D action in rachitic rats.**—*J. biol. Chem.* **157.** 99–104. [For previous parts, see *V. B.* **13.** 367.] **2004**

Work with radioactive phosphorus has been followed up by an investigation by means of tracer experiments with radioactive calcium and strontium of the mode of action of vitamin D in the healing of rickets. The experimental results lead to the conclusion that vitamin D exerts its healing effect partly by favouring absorption of calcium from the intestinal tract and partly by exerting a direct influence on the process of mineralization of bone in rachitic animals.—E. KODICEK.

WARKANY, J. (1943.) **Effect of maternal rachitogenic diet on skeletal development of young rat.**—*Amer. J. Dis. Child.* **66.** 511–516. **2005**

In about 45% of cases the offspring of female rats initially 3–5 months old which had been fed on a rachitogenic diet [no 2965 of STEENBOCK & BLACK. (1925)] together with an added 2% of dried pig liver, had congenital skeletal malformations. The addition of vitamin D to the maternal diet during pregnancy prevented the appearance of such malformations. The changes described included pronounced curvature of the radii, ulnae, tibiae and fibulae together with angulation of the ribs.—A. N. WORDEN.

BRAUN, W. (1945.) **Studies on the carotenoid and vitamin A levels in cattle. I. Seasonal changes of the carotenoid and vitamin A levels and the normal carotenoid-vitamin A ratio of the blood.**—*J. Nutrit.* **29.** 61–71. **2006**

The carotenoid and vitamin A levels in the blood of 49 cows of different breeds maintained in four groups with different carotenoid and vitamin A intakes were determined periodically for a year. The seasonal changes in carotenoids were mainly dependent on carotenoid intake. The blood level decreased from March to the end of August, during which time all animals were on non-irrigated pasture without dietary supplements. Variations with age, breed and individuality of the animal were found, but pathological disturbances were without direct effect. The vitamin A level in the blood depended not only on the carotenoid and vitamin A intakes, but also on parturition, abortion and acute infections, which produced a marked, though temporary, drop in the vitamin A level. Differences were observed between breeds, but not between individuals and ages. There was a linear increase of vitamin A with increasing blood carotenoid levels. The ratio of vitamin A to carotenoid decreased with increasing carotenoid levels. This ratio was below normal in cases of physiological disturbance such as parturition, abortion and acute infections, slightly above normal in animals on a decreasing carotenoid intake, and well above normal when a vitamin A supplement was fed.—E. M. CRUICKSHANK.

PATRICK, H., & MORGAN, C. L. (1944.) **Studies on the role of vitamin E in chick nutrition.**—*Poult. Sci.* **23.** 525–528. **2007**

Experiments were designed to provide additional data concerning the role of vitamin E in chick nutrition. In one experiment the influence of rancidity on the development of vitamin A deficiency was studied. Both vitamins A and E are rapidly destroyed in the presence of rancid fats. A simplified basal ration which contained lard was supplemented with vitamin A, carotene, vitamin E, or vitamin E and soybean phosphatides and exposed to indirect sunlight for 12 days at room temperature. It was found that, due to surface oxidation, some of the vitamin A and carotene were destroyed, before rancidity developed. All the groups of rations became rancid with the destruction of vitamins A and E, but in the rations which contained the small amount of soybean phosphatides the rancidity was less, the fats appeared to be stabilized and the surface oxidation retarded. Adequate amounts of vitamin E are necessary for utilization of vitamin A and carotene in simplified rations containing lard. Other experiments were planned to investigate the possibility of the association of encephalomalacia with vitamin A deficiency. Practical rations without and with vitamin A and carotene mixed with a small quantity of soybean oil were stored in open paper bags for six months at room temperature. Tests of the fats did not indicate excess peroxides in the rations, but vitamin A and carotene were probably destroyed by surface oxidation. Field encephalomalacia is probably a vitamin A deficiency. —E. M. CRUICKSHANK.

HOUCHIN, O. B., & SMITH, P. W. (1944.) **Cardiac insufficiency in the vitamin E deficient rabbit.**—*Amer. J. Physiol.* **141.** 242–248. **2008**

Experiments carried out on rabbits affected with severe muscular dystrophy as the result of lack of vitamin E showed that the deficiency caused the heart to become very susceptible to any reduction in oxygen supply. As a result, pitressin, which reduces the coronary blood flow, proved fatal to these animals in much smaller doses than those tolerated well by control animals. The deficient heart showed a high resistance to the cardiac glucosides, digoxin and ouabain, in amounts which were rapidly fatal to normal animals. Thoracic X-ray films indicated that some cardiac enlargement was present in the dystrophic animals. It is concluded from these findings that the direct cause of the sudden death of such animals is myocardial failure.—E. M. C.

SHAW, J. H., & PHILLIPS, P. H. (1945.) **Neuropathologic studies of acute and chronic thiamine deficiencies and of inanition.**—*J. Nutrit.* **29.** 113–125. **2009**

In acute vitamin B_1 deficiency, a mild myelin degeneration was observed in the peripheral nerves and in the spinal cord of pigeons, but not in chicks. A definite myelin and axon degeneration of the peripheral nerves and rarely the spinal cord was found both in pigeons and chicks suffering from a prolonged vitamin B_1 deficiency. These changes were more severe than those occurring in inanition. A rise in the level of pyruvic acid in the blood was found in chicks deficient in B_1. The neuropathologic lesions in chronic vitamin B_1 deficiency seem to be due not only to the vitamin B_1 deficiency but also to other factors.—E. KODICEK.

UNNA, K., SINGHER, H. O., KENSLER, C. J., TAYLOR, H. C., Jr., & RHOADS, C. P. (1944.) **Effect of dietary protein on liver riboflavin levels and on inactivation of estradiol by liver.**—*Proc. Soc. exp. Biol., N.Y.* **55.** 254–256. **2010**

Weanling rats of both sexes were provided with diets containing 8% of casein as the sole source of protein. The riboflavin content of the livers of such animals was lower than in controls receiving 18% casein while the ability of liver tissue from rats on the low protein diet to inactivate oestradiol was also lower than in the control rats. Both these defects were overcome by the incorporation of 25 mg. daily of *dl*-methionine in the diets of the low-protein group.—A. N. WORDEN.

CARTWRIGHT, G. E., WINTROBE, M. M., JONES, P., LAURITSEN, M., & HUMPHREYS, S. (1944.) **Tryptophane derivatives in the urine of pyridoxine-deficient swine.**—*Johns Hopk. Hosp. Bull.* **75.** 35–47. **2011**

Pigs in which vitamin B_6 deficiency had been produced by methods described previously [see *V. B.* **11.** 627] were found to excrete increased amounts of urinary kynurenine and xanthurenic acid but the excretion of kynurenic acid was more variable. A red pigment, probably urorosein, was also excreted by the deficient animals. It is concluded, therefore, that in vitamin B_6 deficiency the pig does not appear to metabolize tryptophane normally.—A. N. WORDEN.

CERECEDO, L. R., & FOY, J. R. (1944.) **Protein intake and pyridoxin deficiency in the rat.**—*Arch. Biochem.* **5.** 207–210. **2012**

Groups of rats were maintained on pyridoxine-deficient diets containing 15–60% casein. Food intake and growth rate were similar in all groups. In all cases acrodynia appeared first in the animals receiving the high levels of casein, and was delayed or absent in those on the lowest level. On the high levels symptoms developed in a much higher proportion of the animals and were also more severe than on the lower levels. The skin lesions appeared first in the paws and tip of the snout and then spread until the lower limbs and head became involved. In advanced cases the eye was closed by a sticky exudate, and haematuria was frequently observed. The findings suggested a metabolic relationship between pyridoxine and protein.

—E. M. CRUICKSHANK.

CRAVENS, W. W., MCGIBBON, W. H., & SEBESTA, E. E. (1944.) **Effect of biotin deficiency on embryonic development in the domestic fowl.**—*Anat. Rec.* **90.** 55–64. **2013**

Laying pullets were fed on a basal synthetic ration adequate in respect of all known factors except biotin. The birds were divided into six groups which received amounts of biotin ranging from nil to 150 μg. biotin concentrate per kg. of the ration. Embryos of incubating eggs from hens on the basal diet or on a diet moderately deficient in biotin showed two pronounced peaks of mortality, the first being about the third day and the second during the last three days of incubation. In the basal group mortality was highest at the first peak, while in the moderately deficient group mortality was less during the early stages and highest towards the end of incubation. The effect of a biotin deficiency in the developing egg was obvious within a short time of feeding the hens the experimental rations. Chondrodystrophy was the most striking symptom observed in the embryos from the eggs of the deficient groups. It was entirely absent when the ration contained 90 μg. or more of biotin per kg. The type of chondrodystrophy differed from that observed in Mn deficiency. Syndactyly occurred in the embryos when the hens received suboptimal amounts of biotin, but its incidence was low. The possible relationship of some of the abnormalities observed to hereditary and other factors is discussed.—E. M. CRUICKSHANK.

PEARSON, P. B., & LUECKE, R. W. (1945.) **Studies on the metabolism of nicotinic acid in the horse.**—*Arch. Biochem.* **6.** 63–68. **2014**

Horses maintained normal growth on a diet providing approximately 0·1 mg. of nicotinic acid per kg. of body weight per day. When the daily intake of nicotinic acid was reduced to 0·01 mg. per kg. of body weight the amounts excreted in the urine and the faeces each exceeded the intake. On the basis of these data it appears that nicotinic acid is synthesized in the body of the horse and that this vitamin is not a dietary essential for the horse.

An average of 43% of dosed nicotinic acid was excreted in the urine, when 5 g. of the vitamin were fed to the horse. Neither trigonelline nor N-methyl nicotinamide were the principal end products of metabolism in the urine of the horse as they are in the dog, human being and rat.—E. KODICEK.

SMITH, S. G. (1944.) **Progressive ascending paralysis in dogs due to deficiency of a vitamin B complex factor found in yeast.**—*Science.* **100.** 389–390. **2015**

A group of 12 dogs was maintained on a purified basal diet free from the components of the B complex, but supplemented with B_{12}, riboflavin, pyridoxine, nicotinic acid, pantothenic acid and *p*-aminobenzoic acid, inositol and choline. On this diet 11 of the animals gradually developed paralysis, early signs being a peculiar gait and an arching of the neck, with marked spasticity of the hind legs. The final stage was rapidly progressive and ascending, the hind legs, forelegs, neck and respiratory centre each becoming involved in turn. The paralysis was rapidly fatal if not treated, but was cured by a water extract of yeast; several cases responded well to synthetic biotin administered subcutaneously in doses of about 100 μg. per kg. body weight.—E. M. CRUICKSHANK.

SHAW, J. H., & PHILLIPS, P. H. (1945.) **Neuropathologic studies of pantothenic acid, biotin and folic acid complex deficiencies in the chick.**—*J. Nutrit.* **29.** 107–112. **2016**

Chicks fed on diets deficient in pantothenic acid developed neuropathologic lesions consisting of widespread myelin and axon degeneration, but no degeneration in the peripheral nerves. Complicating deficiencies which appeared on one of the rations used did not alter the character of the neuropathologic lesions due to the pantothenic acid deficiency. A mild biotin deficiency revealed no neuropathologic changes. An acute folic acid deficiency produced a mild myelin degeneration in the sciatic nerve, but no lesions in the spinal cord. The authors concluded that myelin and axon degeneration observed in the spinal cord in pantothenic acid deficiency in the chick is due to the deficiency of the vitamin alone and not to the lack of any other nutritional factor.

—E. KODICEK.

HERTZ, R., & SEBRELL, W. H. (1944.) **Impairment of response to stilbestrol in the oviduct of chicks deficient in *L. casei* factor (" folic acid ").**—*Science.* **100.** 293–294. **2017**

In the normal bird stilboestrol administered caused a marked increase in the thickness of the muscular and mucosal layers of the oviduct and a consequent gain in weight. In chicks maintained on a diet deficient in *Lactobacillus casei* factor (" folic acid ") this effect was not observed, but supplementing the diet with " folic acid " either from hatching or only for the 10 days previous to autopsy, caused a marked increase in oviduct weight. Chicks deficient in pantothenic acid gave a normal response to stilboestrol administration. The results emphasize the interrelationship between adequate nutrition and normal endocrine function.—E. M. C.

LUSTIG, B., GOLDFARB, A. R., & GERSTL, B. (1944.) **The effect of vitamins and sex hormones in dietary achromotrichia in mice.**—*Amer. J. Physiol.* **141.** 259–261. **2018**

The greying of hair which developed in mice of the C 57 strain which were kept on a pyridoxine-deficient diet was not prevented or cured by *p*-aminobenzoic acid and/or pantothenic acid, or by cystine or inositol. The females appeared less susceptible to greying than the males. Administration of theelin to male mice decreased

the rate and degree of greying, but injection of the same amounts of testosterone dipropionate had no effect on the development of achromotrichia in female mice.
—E. M. CRUICKSHANK.

MACCARI, A. (1941.) Ricerche sperimentali sull' influenza dell'acido ascorbico sul potere battericida del sangue in toto. [**The influence of ascorbic acid on the bactericidal power of blood.**]—*Boll. Ist. sieroter. Milano.* **20.** 161–167. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 295.] **2019**

The administration to rabbits of 50 mg. ascorbic acid on each of six consecutive days had no appreciable effect on the bactericidal power of the blood of these animals with regard to streptococci, staphylococci, *Bacterium coli*, etc.—A. EDEN.

MEYER, E., & MEYER, M. B. (1944.) **The pathology of staphylococcus abscesses in vitamin C-deficient guinea pigs.**—*Johns Hopk. Hosp. Bull.* **74.** 98–118. **2020**

G. pigs were fed a diet adequate for normal growth and reproduction when supplemented by pure *l*-ascorbic acid. Local abscesses were provoked by the intracutaneous injection of a pure culture of a strain of *Staph. aureus* isolated from a carbuncle in a human patient. In animals receiving a supplement of ascorbic acid the abscess became hard and button-like, whereas in scorbutic animals the lesion was soft and not sharply demarcated, as a result of continued haemorrhage, defective fibril formation and disorderly arrangement of the connective tissue. Proliferation of fibroblasts continued in deficient animals longer than in the controls and no normal collagen was formed. During the early reaction at the site of injection the appearance of macrophages was delayed and the total number was reduced, but phagocytosis by these cells and by neutrophiles was normal. Scorbutic animals showed anaemia and low plasma proteins.—E. G. WHITE.

*ORLA-JENSEN, S., DAM, A. H., & GLAVIND, J. (1941.) Ueber die K-Vitaminbildung einiger Darmbakterien. [**Formation of vitamin K by certain intestinal bacteria.**]—*Zbl. Bakt. II.* **104.** 202–204. [Abst. from abst. in *Bull. Inst. Pasteur.* **41.** 263.] **2021**

Intestinal bacteria were grown in synthetic medium and in a medium containing pepsin-digested casein and yeast autolysate with glucose and added salts, and the production of vitamin K was assayed by the standard chick test. Though initially none of the vitamin was present the growth of 1·0 g. dry weight of *Bacterium coli* led to the formation of 750–1,600 units of vitamin K in the casein medium and of 1,000 units in the synthetic medium. Corresponding figures for *Lactobillus bifidus* and *Streptococcus faecalis* were 200 units and for *Microbacterium lacticum* 300 units for 1·0 g. dry matter of bacterial growth.—A. EDEN.

UNDERWOOD, E. J., ROBINSON, T. J., & CONOCHIE, J. (1942.) **Biochemical studies of pregnancy toxaemia in sheep.**—*Aust. vet. J.* **18.** 220–227. **2022**

Two groups of 18 first-cross Border Leicester merino ewes were maintained in the field during the last 5–6 weeks of pregnancy on a poor, and on a moderately good, plane of nutrition respectively. Serum calcium levels remained within normal limits throughout the last three months of pregnancy, although showing a tendency to fall in both groups as pregnancy advanced. In the poorly fed group blood ketone levels rose in the last seven weeks of pregnancy and most of the ewes developed mild to moderate ketonaemia. The only two ewes carrying twins showed very high values and died of pregnancy toxaemia. In the better fed group where the rise was very small there were no losses. Fasting for 48 hours produced a marked increase in blood ketone levels, the effect being much more pronounced with the ewes from the poorly fed group.

In five cases of pregnancy toxaemia studied, all showed a high degree of ketonaemia, excessive fat deposition in the liver, and almost complete exhaustion of liver glycogen reserves. The foetuses from these affected ewes were all found to have livers practically free from fat and with variable but low glycogen reserves.
—R. L. REID.

FOSS, J. O., & EVELETH, D. F. (1944.) **Vitamin A deficiency in the production of pregnancy disease of sheep.**—*Vet. Med.* **39.** 313–315. **2023**

An outbreak of what appeared to be pregnancy toxaemia was investigated in a flock of 300 ewes. Symptoms and lesions included weakness, ketonuria, a moderate degree of fatty change in the liver, slight swelling of the kidneys and in a single instance conjunctivitis and corneal opacity. The diet comprised maize silage, later replaced by grain and lucerne hay. Chemical analysis of the hay indicated that it was of very low carotene content [details not given]. Vitamin A, in daily individual doses of 30,000 I.U., promoted disappearance of the ketonuria and clinical recovery in surviving cases which had not become moribund.
—A. N. WORDEN.

PATTON, J. W. (1944.) **Acetonemia, a vitamin A deficiency—II.**—*Vet. Med.* **39.** 271–278. [For previous article, see *V. B.* **15.** 20.] **2024**

P. considers the acetonaemia of dairy cows prevalent in the cotton belt of the U.S.A. during the months of January, February and March to be primarily a vitamin A deficiency, and presents data to show that a low blood level of vitamin A is common in cattle during these months. The vitamin A level of normal cows is about 71 I.U. per 100 ml. blood but in acetonaemia cases is often only about 4 I.U. vitamin A. In two cases of uncomplicated acetonaemia treated with four daily doses of 1,000,000 I.U. vitamin A in capsule form, blood sugar and ketones returned to normal within that time. In three cases of metritis complicated with acetonaemia and so treated, there was rapid disappearance of clinical symptoms, with a slower return of the blood picture to normal within six days. Several bovines with ill defined metabolic disorders and several in poor condition showed low blood vitamin A levels; recovery and improvement in condition resulted from administration of vitamin A. It is claimed that vitamin A therapy is superior to other methods of treatment in causing rapid disappearance of clinical symptoms, immediate decrease of blood ketones and rise of blood sugar, and prompt return of the milk yield to normal.—A. B. PATERSON.

MADSEN, M. L. (1944.) Om Acetonaemi. [**Acetonaemia.**]—*Maanedsskr. Dyrlaeger.* **56.** 241–256. **2025**

M. gives a detailed clinical description of acetonaemia in post-parturient and lactating cows. Variations are described in the symptoms and the features found P.M. Theories of treatment and the relation of sugar and protein intake to the disease are discussed.—J. E.

See also absts. **1939** (diet in avian malaria), **1978**, **1979** (nutrition and helminth immunity), **1990**, **1991** (cholesterol atherosclerosis), **2026** (vitamin research), **2094** ("peat scours").

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

—. (1944.) Ergebnisse der Vitamin- und Hormonforschung. Band 1. Band 2. [**Results of vitamin and hormone research.**] Volume 1 edited by RUZICKA, L., & STEPP, W. pp. xvi + 470. Volume 2 edited by MELLANBY, E., & RUZICKA, L. pp. xv + 520. Leipzig: Akademische Verlagsgesellschaft M.B.H.;

Photo-offset reproduction, New York; Academic Press, Inc. 8vo. [In English, French and German.] 2026

1. These reviews which were first published in 1937 are all by leaders in their own spheres. The first article on vitamins in child health by E. GLANZMANN is of general interest, but the chapters on vitamin B_1 by R. R. WILLIAMS, on cortical hormones by T. REICHSTEIN, on the male sex hormones by M. W. GOLDBERG and on oestrogenic hormones by G. F. MARRIAN, all have a strong chemical bias. Articles by R. L. STEHLE and by W. BERBLINGER deal with the function of the pituitary and others by A. GIROUD, C. A. ELVEHJEM, H. VON EULER and H. GUGGISBERG deal with the general significance of vitamins.

2. In the first article of this volume, M. MELLANBY & J. D. KING discuss the part played by vitamins in dental caries. Many of the reviews are written by chemists—these include discussions on vitamin D by H. BROCKMANN, on ascorbic acid by W. N. HAWORTH & E. L. HIRST, on carcinogenic substances by J. W. COOK and on flavins by P. KARRER. Articles of more biological interest include those on vitamin D by E. ROMINGER, on "trace elements" by G. BERTRAND, on the effect of male hormones on females by V. KORENCHEVSKY, on the relation of sex hormones and cancer by A. LACASSAGNE, on plant growth hormones by A. J. HAAGEN-SMIT, and on insulin by B. A. HOUSSAY and V. DEULOFEU.—E. BOYLAND.

SPIELMAN, A. A., PETERSEN, W. E., & FITCH, J. B. (1944.) **The effect of thyroidectomy on lactation in the bovine.**—*J. Dairy Sci.* **27.** 441–448. 2027

The thyroid gland was removed from four Holstein cows at different stages of gestation and lactation and the effect on milk yield and composition was studied. In all cases, whether thyroidectomy was performed before or after calving, it caused cessation of lactation in about 180 days, total milk and total fat yield being reduced by about 75%. The oral administration of fresh thyroid restored milk and fat yields to former levels with decreasing response to thyroid therapy as the lactation period advanced. The oral administration of 5–28 g. of dinitrophenol to two of the cows produced a variable response in milk and fat yield, some slight increase being obtained with a single 28 g. dose. Replacement therapy with iodinated casein in one of the cows was unsuccessful, but since this animal failed to respond to thyroid therapy, the result must be regarded as inconclusive. The composition of the milk of thyroidectomized cows was unchanged as regards fat, lactose and nitrogen contents and specific gravity.—A. B. PATERSON.

KNODT, C. B., & PETERSEN, W. E. (1944.) **The effect of complete evacuation of the mammary gland by pitocin upon milk and fat production.**—*J. Dairy Sci.* **27.** 449–457. 2028

Five Holstein cows in declining lactation were injected intravenously with 1 ml. pitocin (10 I.U. oxytocic principle) after each milking during a period of 14 days. The milk yield before injection and any further yield of "pitocin milk" after injection, were determined, both samples being analysed for lactose, chloride, and fat. The 14 days before and after the experimental period served as control periods.

In all cases complete evacuation of the gland with pitocin checked the downward trend of lactation. The lactose and chloride contents of the milk were unaffected by pitocin injections, but the fat content was significantly increased, especially in "pitocin milk". Pitocin injection in three cows which did not let down their milk caused complete evacuation of the gland and it is suggested that decline in milk yield with advancing normal lactation is due to an incomplete let-down of milk. Any milk retained in the gland has a depressing effect on subsequent production.—A. B. PATERSON.

OLSON, O. E. (1940.) **pH values of the contents of the gastro-intestinal tracts of some farm animals.**—*Proc. S. Dak. Acad. Sci.* **20.** 34–41. 2029

It has been found that the nitrate content of plants is partly converted to nitrite in the rumen of the cow, the nitrite causing methaemoglobinaemia which may result in anoxaemia and death. In horses and sheep the nitrates are not reduced to nitrites in the gastro-intestinal tract.

A study of the pH values of the ingesta of cattle, sheep and pigs was made. The samples were collected as soon as possible after the animals had been killed. The pH values of the ingesta from the various stomachs of the sheep were found to be similar to those of cattle. Some factor other than the pH of the rumen contents causes the difference of reaction between sheep and cattle to plants with high nitrate content. pH values of the ingesta of pigs' stomachs were approximately the same as those of the abomasa of cattle and sheep. The contents of the small and large intestines of sheep were found to be slightly acid to neutral. The contents of the large intestine of the pig were found to be somewhat more acid than those of the small intestine.—E. M. J.

MYBURGH, S. J., & QUIN, J. I. (1943.) **Studies on the alimentary tract of merino sheep in South Africa IX.—The H-ion concentration in the forestomachs of fistula sheep under different experimental conditions.**—*Onderstepoort J. vet. Sci.* **18.** 119–130. [For part VIII, see *V. B.* **15.** 196.] 2030

It was found that the H-ion concentration of fresh ingesta immediately after withdrawal by aspiration through permanent fistulae from the rumen of merino sheep kept on a variety of controlled diets, varied between 5·5 and 6·8, depending on the carbohydrate content of the diet. There was only slight fluctuation during the digestion of a single meal, the tendency being towards increased acidity in 4–6 hours with a subsequent return to the previous level. While lucerne hay produced slight acidity, fresh green lucerne produced a slightly alkaline condition. Rumen material was found to be relatively well buffered between pH 6·8 and 7·8 but beyond this range on either side the efficiency of the buffering was reduced. The colour and odour of rumen ingesta were found to be closely correlated with the pH and ability to ferment glucose.—E. M. R.

GREEN, W. W. (1944.) **Urine excretion by boars.**—*Amer. J. vet. Res.* **5.** 337–340. 2031

Boars of inbred lines were placed in metabolism crates with access to water and fed a wet mash twice daily over 48-hour periods during which the amount of urine excreted was collected and measured. The animals used were 10–76 weeks old and were representative of both spring and autumn litters. The amounts of urine excreted over a 48-hour period varied from nil to 15,600 ml., average 4,287 ml. with standard deviation 2,299. Autumn-born pigs excreted more urine than those born in spring, but the actual amount appeared to be more closely associated with age than with particular season of the year. Significant line differences were found, suggesting that a genetic factor may play some part in determining the control of the excretion.—A. EDEN.

COUCEIRO, A., VIEIRA, L. G., & DE MORAES, J. (1944.) Ação da tiouracila sôbre a fixação de iodo pela tiróide.

[Action of thiouracil on the uptake of iodine by the thyroid gland.]—*Rev. brasil. Biol.* **4.** 173–184. [English summary.] **2032**

The thyroids of rats given thiouracil in the drinking water increase in weight and become hyperaemic. The epithelial cells of the glands become transformed into tall columnar cells, encroaching on the diminished colloid, and in some places entirely obliterating the lumina of the follicles. Mitotic figures can be seen in some cells.

"Autographs" [see abst. 2080 in this number] show that thiouracil-treated rats largely lose the ability to store iodine in the thyroid gland.—I. W. B.

Couceiro, A., & Vieira, L. G. (1944.) Ação da tiouréia sôbre a fixação de iodo pela tiróide. **[Action of thiourea on the uptake of iodine by the thyroid gland.]**—*Rev. brasil. Biol.* **4.** 323–327. [English summary.] **2033**

Seven rats were fed on a normal diet, four of them receiving a 0·5% solution of thiourea for drinking water over a period of 20 days. On the 20th day, each rat was given a subcutaneous injection of radioactive iodine. The animals were destroyed 48 hours later.

The thyroids of the rats given thiourea were enlarged and congested. Sections showed evidence of hyperaemic hyperplasia, and hypertrophy. The glands contained no appreciable quantities of radioactive iodine. The thyroid glands of the control animals were macroscopically and microscopically normal. They contained a very much larger amount of radioactive iodine than those of the thiourea-treated rats.—I. W. B.

Hertz, R., Fraps, R. M., & Sebrell, W. H. (1944.) **Endocrinological aspects of avidin formation in the avian oviduct.**—*Science.* **100.** 35–36. **2034**

Both desoxycorticosterone acetate and testosterone propionate, when injected into chicks previously treated with stilboestrol, were found to induce avidin formation, the former being almost as effective as progesterone. In experiments on oestrogenized chicks, which were given progesterone subcutaneously, the presence of avidin could be demonstrated in the oviduct at the end of two hours and considerable amounts were present within 4–8 hours. The avidin titre was considerably raised when increased amounts of stilboestrol were administered simultaneously with progesterone, and when increasing amounts of progesterone were given with or without stilboestrol administration. The data obtained indicated that avidin may be associated with the physiology of reproduction.—E. M. Cruickshank.

Salisbury, G. W., Elliott, I., & Van Demark, N. L. (1945.) **Further studies of the effect of dilution rate on the fertility of bull semen used for artificial insemination.**—*J. Dairy Sci.* **28.** 233–241. **2035**

This report presents a continuation of studies previously reported [see *V. B.* **14.** 169] on the effects of an increased dilution of bull semen with egg-yolk citrate upon its fertility when used for routine artificial insemination. In the present investigation involving 3,296 inseminations, the dilution rates were compared of 1 part of semen to 8, 12, 16, 24 and 50 parts of egg-yolk citrate. The following average numbers respectively of spermatozoa were contained in the 1 ml. of diluted semen used for each insemination: 150, 104, 80, 54 and 26 millions. No statistically significant differences were found in fertility of the semen for the five dilution rates compared. 93·3% of all inseminations were made on the second and third day following collection; only 5·3% of the total inseminations took place four or more days after collection. The semen diluted at the highest rate was not used as efficiently as the semen diluted at the lower rates, but, on the average, seemed to maintain its fertility as well for four days after collection. The results indicate a great potential expansion of artificial insemination by the use of increased dilution.—N. J. Scorgie.

*Bauer, T. (1942.) Untersuchungen über den Damm (Perinaeum) und den Schamschluss bei Stuten. **[Morphological observations on the perineum of mares.]**—*Inaug. Diss., Hanover.* [Abst. from abst. in *Dtsch. tierärztl. Wschr.* **50.** 432.] **2036**

Measurements were made of the perineal region of 1,000 mares, grouped according to breed and age. Variations in breadth of up to 6–7 cm. were noted in the heavier breeds and proportionately less in the lighter breeds and thoroughbreds. Group findings are given according to breed and type for the presence of structural defects and perineal scars, and the association is mentioned between size of perineum and occurrence of dystokia.—C. W. Ottaway.

*Zimmermann, A. (1942.) **[Comparative anatomy of the carotid body.]**—*Math. term. Ert.* **60.** 900–912. [In Hungarian.] [Abst. from abst. in *Jber. Vet.-Med.* **70.** 517.] **2037**

The carotid body of the horse is not encapsulated; its cells blend with the surrounding tissue and with the arborization of the ninth and tenth cranial nerves and sympathetic fibres which assist in forming the plexus. Within the body, the sinus caroticus (ganglion intercaroticum) is formed of lamellated elastic tissue with interspersed nerve twigs and nerve endings.—C. W. O.

Schilling, H. (1942.) Über den mikroskopischen Bau der Hörner des Hausrindes. **[The histology of the horns of cattle.]**—*Wien. tierärztl. Mschr.* **29.** 508–509. [*Inaug. Diss., Vienna*—only abst. given.] **2038**

The layers of horn, although modified, were found to correspond with those of skin and as such, both superficial and deep structures were closely bound together. The stratum corneum was thick, entirely keratinized and appeared as a direct outgrowth from the germinative cells, as no representation of either the stratum granulosum or stratum lucidum was observed. The deposition of horn was, in the main, lamellar, which is said to account for the striation on the superficial surface.

—C. W. O.

Butenandt, A. (1944.) Biochemische Probleme der Vererbungsforschung. **[Biochemical factors in heredity investigations.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Feb. 4th. 51. **2039**

B. discusses briefly four biochemical approaches to the study of the structure and properties of hereditary factors or genes. (1) The gene may be regarded as a large complex chemical molecule, since in mutation it appears to obey physical-chemical laws as they are known to apply to the loosening of atomic bonds. (2) There is the possibility of synthesizing the gene molecule from materials of a nucleoprotein nature. (3) The gene undoubtedly resembles the molecule of the tobacco mosaic virus, also of a nucleoprotein nature, in its structure, size, and ability to reproduce and mutate within the cell. (4) The gene resembles structurally many of the vitamins and enzymes, through the control of whose production and utilization the hereditary character carried by the gene is often realized.—A. C.

See also absts. **1993** (adrenal cortex physiology), **1994** (oestrogens and fibroma), **2003** (Ca : P ratio and parathyroid), **2010**, **2017**, **2018** (sex hormones), **2108** (history of comparative anatomy), **2090** (embryology).

POISONS AND POISONING

SKJERVEN, O. (1944.) Natriumklorat-forgiftning. [**Sodium chlorate poisoning in cattle.**]—*Norsk VetTidsskr.* **56.** 274–276. **2040**

Out of five cows, turned out on pasture on which a farmer had two days previously scattered about one pound of sodium chlorate to kill thistles, two died after diarrhoea lasting a few hours and the rest were dull.

The carcasses of the dead cows showed a peculiar green discoloration of the internal organs, but practically nothing else and no notable gastro-enteritis. $NaClO_3$ was detected by analysis of the stomach contents and considered to be the cause of death. This chemical causes methaemoglobinaemia.—J. E.

*FREITAG, R. (1942.) Vergiftungen durch Fluoride. [**Fluoride poisoning.**]—*Z. ärztl. Fortbild.* p. 45. [Abst. from abst. in *Dtsch. tierarztl. Wschr.* **51.** 139.] **2041**

Sodium fluoride is widely used in industry and fluoride deposited on the herbage in the neighbourhood of hydrofluoric acid, aluminium and beryllium factories may produce toxic symptoms in cows. In the production of beryllium, fluorine-containing gas and a finely dispersed fluoride-containing dust are produced; these have irritant effects on the respiratory tract. [Fluoride poisoning may be caused either by fluorine compounds occurring naturally in water or herbage or by fluorides deposited from nearby industrial plants.] —E. BOYLAND.

DAM, H. (1944.) **Galactose-poisoning in chicks.**—*Proc. Soc. exp. Biol., N.Y.* **55.** 57–59. **2042**

During a study concerning the significance of carbohydrate sources in the production of symptoms of vitamin E deficiency, chicks fed a synthetic diet containing 55% of galactose developed violent spasms of leg and wing muscles, and died within a few days. Blood sugar and muscle glycogen remained at normal levels, but liver glycogen practically disappeared. Large amounts of galactose were present in the blood, and it is suggested that this may in some way cause dysfunction of the central nervous system, but the mechanism of the disorder is not clear.—E. M. CRUICKSHANK.

ROCHA E SILVA, M. (1943.) Estudos sobre plantas tóxicas no estado de São Paulo. Ensaios toxicológicos com 27 plantas consideradas "suspeitas". [**Tests of suspected poisonous plants in Sao Paulo.**]—*Arq. Inst. biol., S. Paulo.* **14.** 15–30. [English summary.] **2043**

Toxicity tests carried out mainly on g. pigs indicated that the following plants might be dangerous for stock-feeding:—*Psychotria langsdorffiana, Erythroxylon deciduum, Cestrum sendtnerianum* and to a lesser degree *Mascagnia pubiflora.*

A substance resembling saponin, with powerful haemolytic and toxic properties, was isolated in an almost pure state from *Cestrum sendtnerianum.*—I. W. B.

LUCKHAM, H. DE C. (1944.) **Snake bite in England.**—*Vet. J.* **100.** 68–69. **2044**

L. believes snake bite to be more common than is generally supposed. The adder is the only common poisonous snake in England, but the smooth snake [*Coronella laevis*] is sometimes found in Dorset and the New Forest and is said to be poisonous. Dogs are most commonly bitten, usually about the head, neck or forelegs, but cases are recorded in cattle, sheep, horses, and pigs. Dogs when bitten usually cry out and appear frightened. Signs of tenderness appear round the bite in about ten minutes, followed by swelling, which extends towards the heart, coma, and possibly death from heart failure. L. mentions the death of two dogs from heart failure about a year after being bitten by a snake, and recalls the old saying, "Pain will be felt at the site of the wound on anniversary".

Potassium permanganate injected subcutaneously round the bite is the best antidote [but of doubtful efficacy], with heart stimulants and aspirin to relieve pain. Prognosis is good, if treatment is prompt, and recovered dogs have some immunity.

In cattle a hard residual swelling is said to persist for life at the site of injury. Three cases in which the bite was near the milk vein are described; the cattle did not do well and had to be slaughtered. A colt was bitten inside the thigh but recovered after treatment. L. cites the record of a live adder being found in the rumen of a cow which died suddenly. Sheep may be bitten in the udder, and a ram bitten in the scrotum died. No cases in pigs are described.—A. F. RUSSELL.

See also absts. **1985** ("Glysantin" anti-freeze poisoning of fowls), **1988** (disorders of sheep on subterranean clover) **1990, 1991** (cholesterol toxicity), **2094** (mangold poisoning in pigs).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

MCILWAIN, H. (1944.) **Theoretical aspects of bacterial chemotherapy.**—*Biol. Rev.* **19.** 135–149. **2045**

Bacterial chemotherapy consists of the interaction in the system of drug, parasite and host. Chemotherapeuticals may prevent the parasite from utilizing substances which protect it from the host, *e.g.*, antipneumococcal polysaccharidases, may retard growth, as in the case of the sulphonamides or may react with injurious bacterial products, as do antitoxins. "Working upon chemical analogues with the minimum of biological knowledge, the proportion of successful agents has been extremely small, but to such methods are owed the compounds which initiated chemotherapy and provided material for the theorist."

Examples of chemotherapy by drug antagonism or interference with metabolism are discussed with reference to the action of arsenic and mercury derivatives, of sulphonamides and of acridine compounds. The sulphonamides produce their effects by changing the course of growth of organisms. Parasites may develop resistance to drugs both *in vitro* and *in vivo.*

Many references are given.—E. BOYLAND.

SINGER, E. (1944.) **Experimental empiricism in chemotherapeutic research.**—*Med. J. Aust.* June 17th. 549–552. **2046**

S. reviews the development of chemotherapy, dealing primarily with the protozoan infections. The present knowledge of the action of chemotherapeutic substances divides them into three classes: (1) those which are selectively absorbed and interfere with the internal metabolism of the parasite, (2) those which are not absorbed but interfere with external nutritional metabolism and (3) those which do not interfere with the parasite, but exert their effects on its toxic products. S. points out that knowledge of the manner of action of chemotherapeutic substances is still slender and that most advances have been made empirically.—D. F. S.

BAZELEY, P. L. (1944.) **"Antimicrobials, with special reference to tyrothricin and penicillin."**—*Aust. vet. J.* **20.** 275–276. **2047**

In an address to the Victoria Division of the Australian Veterinary Association, B. discusses the modes of action of antimicrobials in general. Penicillin

when pure has no adverse effect on body tissues, but tyrothricin is somewhat destructive for erythrocytes and its use is usually confined to external treatment. It has been used as an udder infusion in mastitis because of its diffusibility, its freedom from harmful effect on tissues and its freedom from inhibition by tissue substances.

The production and uses of penicillin are described. In animals it will be most useful as a local application because of the high cost of parenteral administration. Penicillin as an ointment and as a dusting powder with sulphanilamide has been effective in human use.

Penicillin resistance in some strains of organisms seems to depend on an inherent resistance rather than on one developed in response to a penicillin environment.—D. C. BLOOD.

LEE, S. W., FOLEY, E. J., & EPSTEIN, J. A. (1944.) **Mode of action of penicillin. I. Bacterial growth and penicillin activity—Staphylococcus aureus FDA.** —*J. Bact.* **48.** 393–399. **2048**

Penicillin is most actively bactericidal on growing organisms, so that more organisms are killed when a rich nutrient medium is employed and when the organisms are in the logarithmic phase of growth. Low concentrations of penicillin will only kill growing bacteria but high concentrations will kill old organisms. It is suggested that a definite fraction of each generation is killed by penicillin; this fraction depends upon the experimental conditions.—E. BOYLAND.

JOHNSON, F. H. (1944.) **Observations on the electron microscopy of *B. cereus*, and tyrothricin action.**—*J. Bact.* **47.** 551–557. **2049**

The normal cells of *Bacillus cereus* appear to have a well defined wall which thickens just before cell division. At the time of division the cell wall is stretched. Lysis in the presence of tyrothricin occurs without definite intermediate forms being produced. "Ghosts" of cells and cells undergoing granular disintegration were frequently seen in tyrothricin cultures and occasionally in control cultures.—E. BOYLAND.

KATZMAN, P. A., HAYS, E. E., CAIN, C. K., VAN WYK, J. J., REITHEL, F. J., THAYER, S. A., DOISY, E. A., GABY, W. L., CARROLL, C. J., MUIR, R. D., JONES, L. R., & WADE, N. J. (1944.) **Clavacin, an antibiotic substance from *Aspergillus clavatus*.**—*J. biol. Chem.* **154.** 475–486. **2050**

Clavacin was isolated as a pure crystalline substance and was found to be identical with patulin, which had previously been isolated from *Penicillium patulum* by RAISTRICK in England [see *V. B.* **14.** 211]. Although the substance inhibits the growth of many bacteria and fungi it is extremely toxic to animals. The bactericidal action is inhibited by rabbit serum but not by sera from other species.—E. BOYLAND.

WAKSMAN, S. A., & BUGIE, E. (1944.) **Chaetomin, a new antibiotic substance produced by *Chaetomium cochliodes*. I. Formation and properties.**—*J. Bact.* **48.** 527–530. **2051**

GEIGER, W. B., CONN, J. E., & WAKSMAN, S. A. (1944.) **Chaetomin, a new antibiotic substance produced by *Chaetomium cochliodes*. II. Isolation and concentration.**—*Ibid.* 531–536. **2052**

I. Chaetomin was produced by a special strain of *Chaetomium cochliodes* grown on Czapek-Dox medium supplemented with corn steep liquor and calcium carbonate. The antibacterial agent resembled penicillin in being soluble in ether and in the organisms which it inhibited *in vitro*. It was not very toxic to animals but it did not protect animals against bacteria which were sensitive to it *in vitro*.

II. Chaetomin is present in much higher concentration in the mycelium than in the culture filtrate. It can be extracted from the mycelium with acetone or from the culture filtrate with ethyl acetate. Impurities can be removed by washing the solution in ethyl acetate with sodium carbonate solution and by chromatographic absorption on alumina. It contains both nitrogen and sulphur but differs from penicillin, gliotoxin, and tyrothricin in its biological action.—E. BOYLAND.

BRYAN, C. S., HEDEMAN, L. P., VISGER, E. E., & CUNKELMAN, J. W. (1944.) **Phemerol in the treatment of 176 cows with chronic streptococcic mastitis.** —*Vet. Med.* **39.** 417–420. **2053**

Phemerol is a 1 : 1,000 aqueous solution of para-tertiary-octyl-phenoxy-ethoxy-ethyl-dimethyl-benzyl-ammonium chloride monohydrate. The authors describe experiments to ascertain its usefulness as an udder infusion in the treatment of mastitis due to *Streptococcus agalactiae*.

Results were assessed by the examination of smears of incubated milk before treatment, and again after treatment as soon as the milk had become normal in appearance. Of 171 cases, none of which showed marked induration of the udder, 147 were rendered free of streptococci. Five cows with marked induration of the udder failed to improve after similar treatment, and such cases are not considered suitable for treatment with phemerol.

Transitory oedema of the udder usually occurred, with a temporary fall in milk yield. More severe irritation, causing definite deterioration of the udder, occurred in six cows. Effects were most severe in cows in the early stages of lactation. The dose recommended is 75 ml. in each quarter, smaller doses being less effective and no less irritant.—C. M. FORD.

BONTSCHEFF, N. (1942.) Über Versuche einer Beeinflussung der Infektion mit Geflügelcholerabakterien durch die Sulfonamide "Cibazol" und "Eubasinum". **[Attempts to modify fowl cholera by the sulphonamides cibazol (= sulphathiazole) and eubasinum (= sulphapyridine).]**—*Arch. wiss. prakt. Tierheilk.* **78.** 195–206. **2054**

Sulphathiazole and sulphapyridine both inhibit the growth of *Pasteurella aviseptica* in broth or agar. Both drugs are able to prevent the death of mice infected with the organism if they are given within one hour of infection. Sulphapyridine causes damage to the liver and kidneys of hens and will not protect them from fatal infection. Sulphathiazole is less injurious and three injections will cure fowls infected with fowl cholera. [No actual figures for the treatment of fowls are given.] —E. BOYLAND.

RÖSLER, M. (1943.) Versuche einer Beeinflussung des Schweinerotlaufs durch Sulfonamide. **[Treatment of *Erysipelothrix rhusiopathiae* infection in pigs with sulphonamides.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 169–174. **2055**

The organism is inhibited *in vitro* either in broth or on plates by sulphapyridine and sulphathiazole but not by tibatin (diaminodiphenylsulphone galactoside), prontosil soluble, albucid or globucid. Sulphapyridine was the most effective of the drugs in protecting mice against lethal infections of the organism, while sulphathiazole was the only one of the other drugs which had any effect in mice. Injection of sulphathiazole or sulphapyridine into pigs infected with a broth culture of the bacteria did not prevent the development of the disease although they both reduced the pyrexia. [British and American workers agree upon the difficulty of infecting pigs by inoculation of culture.] Both sulphathiazole and sulphapyridine are acetylated *in vivo* by mice, g. pigs and pigs and the acetylated drugs are liable to crystallize in the urinary tract; pigs appear to be particularly sensitive to sulphapyridine.—E. B.

WISE, G. H., & ANDERSON, G. W. (1944.) **The control of diarrhea ("white scours") of new-born dairy calves by means of serum and sulfaguanidine.**—*J. Dairy Sci.* **27.** 965–979. **2056**

The authors review the American literature on "white scours" and give details of experimental observations made during a prolonged outbreak of the disease in a dairy herd. Coliform organisms were isolated from a number of the affected animals. Control measures investigated included, in addition to general herd hygiene, the use of vitamins A & D (as cod liver oil), a commercial polyvalent antiserum, and sulphaguanidine. Neither cod liver oil nor serum proved of practical value for prophylaxis or for treatment of clinical cases of the disease. Sulphaguanidine, however, gave excellent results, allowing the following recommendations to be made: As a prophylactic the drug need only be used in the period from birth to 48 hours after, when the calf is most susceptible. The dose advocated is 2 g. shortly after the first colostrum consumption, 2 g. 6–8 hours later and subsequent doses at the same level night and morning through the second or third day. For treatment of clinical cases dosage varies with the severity of the case. The following regime is recommended as a basis :– first dose 7 g., second dose 5 g., third and subsequent doses 4 g.

—D. D. OGILVIE.

PETHERICK, M. H., & SINGER, E. (1944.) **The action of metals on bacterial intoxication.**—*Aust. J. exp. Biol. med. Sci.* **22.** 21–27. **2057**

Two detoxication mechanisms are described. In the first, iron, copper or zinc and ascorbic acid, adrenalin or glutathione are implicated. The second operates by the combined action of manganese and hydrogen peroxide. The first mechanism detoxifies diphtherial, staphylococcal, and *Clostridium welchii* Type A toxins but not that of *Cl. welchii* Type D. The second detoxifies *Cl. welchii* Types A and D and staphylococcal toxins.—D. F. STEWART.

*PERRIN, M. G. (1942.) Traitement de la coccidiose bovine par la quinacrine. **[Treatment of bovine coccidiosis with quinacrine (= atebrin).]**—*Rec. Méd. vét.* **118.** 24–28. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 93.] **2058**

Quinacrine has proved efficacious in cases of rabbit and bovine coccidiosis. Cattle were given 0·8 g. in a litre of water morning and evening *per os*, or 1·5 g. with 40 ml. distilled water intravenously. In most cases the passing of blood in the faeces ceased on the day following treatment by intravenous injection. Altogether 35 animals with severe intestinal coccidiosis were treated, 23 *per os* and 12 by intravenous injection. Only one animal died. Optimum dosage per day per 100 kg. live weight is as follows : orally 1·0 g. in 1,000 ml. of water, intravenously 1·0 g. in 20 ml. of distilled water.

—C. HORTON SMITH.

WHEELER, A. H., & NUNGESTER, W. J. (1944.) **The effect of atropine sulfate on the course of influenza virus infection.**—*Science.* **100.** 523–524. **2059**

Mice were given 1 mg. of atropine intraperitoneally at various intervals before and after the intranasal instillation of approximately 1 M.L.D. of influenza A virus. No effect was detected when the interval was 12 hours. With intervals of 15 min. to 6 hours, however, there were fewer deaths : the mean survival time was increased and the incidence of lesions was reduced. This effect is ascribed to the properties of atropine of preventing the aspiration of mucous secretions which are likely to augment the action of the virus.

—R. E. GLOVER.

MÖNNIG, H. O. (1943.) **Sheep blowfly research VI.—The treatment of mylasis.**—*Onderstepoort J. vet. Sci.* **18.** 73–84. [For previous parts see *V. B.* **15.** 189.] **2060**

M. lists the properties of an ideal blowfly dressing and describes experimental work directed towards evolving this dressing, which should be rapidly lethal to the maggots and should cause the strike wounds to become unattractive to blowflies and to dry and heal quickly. The larvicidal activity of neutral tar oils is greatly increased by the addition of alcohol. The further addition of a suitable acid increases larvicidal efficacy, makes wounds unattractive and promotes rapid healing.

The official mixture as now made in South Africa has the following composition :– 40% of 96% alcohol, 5% of mineral oil (S.A.E. 60), 10% of mineral oil (C. 1 fuel), 2·5% of cresol, 0·15% of sulphuric acid, 21·175% of benzol, and 21·175% of creosote oil (boiling point 200°–240°C.).

The efficacy of the mixture against maggots and ticks remains as high as before, when neutral creosote oil was used in place of a mixture of benzol and creosote oil. No apparent pain is caused by its application to strike wounds. Such mixtures are irritant to the healthy skin of sheep. All sheep are not equally affected, sheep with a relatively dry fleece being much less affected than those with much yolk in the fleece.—E.M.R.

PRISELKOV, A. M., & GUR'EVA, A. M. (1940.) Toksichnost' i akarotsidnost' kreolinov, prigotovlennykh iz torfyanykh kislykh masel (*TKM*) gusevskoĭ smoly. **[Toxicity and acaricidal power of creolins prepared with acid tar oils from Gusev peats.]**—*Trud. vsesoyuz. Inst. eksp. Vet.* **15.** 166–171. [French summary.] **2061**

PRISELKOV, A. M., & GUR'EVA, A. M. (1940.) Toksichnost' i akaritsidnost' kreolinov, prigotovlennykh iz kislykh masel ural'skoĭ torfyanoĭ smoly. **[Toxicity and acaricidal power of creolins prepared with acid tar oils from Ural peats.]**—*Veterinariya, Moscow.* No. 3. pp. 119–121. [French summary.] **2062**

Reference is made to earlier work on Redkin peats by PRISELKOV & SHAPOSHNIKOVA [(1934.) *Sborn. nauchn. trud. Sarat. zoovetinst.* **1.** 2], where the methods used are described. Toxicity of the creolins was tested by their action on white mice, after exposure for 2 min. Acaricidal power was tested on groups of up to 40 isolated mange mites (*Psoroptes communis* var. *cuniculi*) which were exposed for a given period at 35°C., and subsequently washed and kept on filter paper for 24 hours at this temperature.

I. The distillates from Gusev peat tars were collected between 200° and 300°C. The acaricidal properties of the acid distillates from peat tars are due to the phenol-cresol components, the neutral oils (hydrocarbons) being quite inactive. Creolins prepared from these acid oils, by the addition of neutralized naphthalene sulphonic acid and green soap as emulsifying agents, are less toxic than, and are less potent acaricides than coal-tar distillates. A table is given showing the properties of :– the acid oils (four successive fractions distilled from Gusev peat tars between 200° and 300°C.) ; their phenol-cresol and neutral-oil components ; creolins derived from these ; a Redkin creolin, and a Moscow coal-tar creolin. In the toxicity tests, the authors found that these substances were more toxic to mice during autumn and winter, than in spring and summer. For treatment of mange in farm animals, they recommend a creolin containing equal parts of all four fractions of Gusev peat-tar distillate, composed of neutral oils (30%) and phenol-cresols (30%), emulsified with neutralized naphthalene sulphonic acid (30%) and green soap (10%). The addition of 0·5–2·0% of caustic

soda facilitates emulsion in hard water without modifying the acaricidal properties.

II. Valley peats from the Urals are chemically distinct from the Gusev and Redkin (upland) peats. They have a high proportion of ammonium acetate, up to 25% of nitrogenous bases, and reduced bitumen content, while upland peats contain no ammonium acetate, only 6% of nitrogenous bases, and have a high bitumen content. Ural peat-tar distillates are considerably more difficult to emulsify, and are more toxic than those from Gusev and Redkin. The acaricidal power of the creolins is intermediate, being greater than in Redkin and less than in Gusev creolins.

—J. ALLAN CAMPBELL.

ØSTERBERG, G. (1942.) **On employment of lucosil (2-sulfanilamido-5-methyl-1,3,4-thiodiazole) for local treatment in ophthalmology.**—*Acta ophthal., Kbh.* **20.** 321–336. [In English.] **2063**

Lucosil is easily soluble and solutions have a pH of 7·3–7·4. It is active *in vitro* against pneumococci, staphylococci, haemolytic streptococci, coliforms and certain other organisms. The repeated instillation of a 4% solution of the agent into the eye caused no irritation or other ill-effects in the author and some of his patients. Experimental pneumococcal keratitis in the rabbit responded to the instillation of the drug and recovery in severe cases was assisted by the intramuscular injection of a 40% solution of the agent. The treatment of cases of keratitis, chronic blepharo-conjunctivitis and acute dacrocystitis in man gave promising results.

—E. G. WHITE.

HENDERSON, W. M. (1944.) **Pentothal sodium as a narcotic in cattle.**—*J. comp. Path.* **54.** 245–247. [Author's summary copied *verbatim.*] **2064**

A description is given of the successful intravenous use of the barbiturate pentothal sodium as a narcotic in cattle. A dose of 3 gm. is required for the induction of deep narcosis in Devon steers of 800 lb. Induction of narcosis is immediate and recovery is rapid, being unattended by any struggling so that restraint is not necessary during this period.

FISCHER, E., HOFFMANN, O., PRADO, E., & BONÉ, R. (1944.) **On the mechanism of bacteriostasis with triphenylmethane dyes.**—*J. Bact.* **48.** 439–445. [Authors' summary slightly amended.] **2065**

Experiments with a strain of *Streptococcus* isolated from cases of scarlet fever show that: (1) oxidized forms of malachite green (carbinol base, dye salt) are bacteriostatic to an equal degree independently of their solubility; (2) leuco-derivatives of malachite green, obtained with bisulphite or hydrosulphite, are also very active whereas the activity of those obtained with NH_3 or cyanide is weak and even doubtful; (3) leucobases of malachite green and gentian violet are not only nonbacteriostatic, but they also prevent the bacteriostatic effects of the active derivatives; (4) rosaniline shows a different behaviour, as its leucobase is bacteriostatically active and its oxidized dye form is not inhibited by any of the tested leucobases.

See also absts. **1922** (chemotherapy of TB.), **1947** (of E.I.A.), **1919** (disinfectants).

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

GREAT BRITAIN. (1944.) **Food and Drugs (Milk and Dairies) Bill. A Bill to amend the provisions of the Food and Drugs Act, 1938, relating to Milk and Dairies Regulations and other matters connected therewith.** pp. ii + 7. London: H.M. Stat. Off. 8vo. 2d. **2066**

This Bill amends the Food and Drugs Act, 1938, in order primarily that certain functions of local authorities in relation to the conditions under which milk (including designated milk) is produced on the farm may be transferred to the Ministry of Agriculture and Fisheries.

The power of making Milk and Dairies Regulations under Section 20 of the principal Act will now be exercised jointly by the Ministers of Health and of Agriculture and Fisheries; the Bill places authority in the hands of the latter for the registration of dairy farms and the refusal or cancellation of such registration.

—J. C. BUXTON.

LAPAGE, G. (1944.) **Cleansing of milk bottles.**—*Nature, Lond.* **153.** 31–32. **2067**

The results of an enquiry carried out by WILSON & HOBBS [see *V. B.* **13.** 443] into the cleansing and sterilization of milk bottles are summarized and compared with those of workers in the U.S.A. Steam sterilization was found efficient if carefully done and virtual sterility could be obtained with hot caustic soda solutions. The spray type of washing machine without brushes gave best results. All coliform bacilli were killed by the detergent, but contamination from the rinsing water was common. Workers in the U.S.A. recommend chlorinated water for rinsing, but Hobbs and Wilson prefer to rinse with water at 120°F. and cool gradually by washing the outside of the bottles at decreasing temperatures. Bottles should be kept inverted if they are not used at once. The use of narrow necked bottles would lessen the risk of contamination from the brim. Paper board containers are ideal but too expensive at present. Milk distribution may be an important factor in the spread of typhoid and other diseases and the responsibility of the householder must not be overlooked.—ANN F. RUSSELL.

*JEPSEN, A., & HANSEN, P. L. (1942.) Opsporingen af Gladsaxe-epidemiens Smittekilde. **[The source of the Gladsaxe epidemic of milk-borne streptococcal infection.]**—*Medlemsbl. danske Dyrlaegeforen.* June 1st & 15th, and July 1st & 15th. p. 365. [Abst. from abst. in *Skand. VetTidskr.* **33.** 483.] **2068**

A large number of cases of septic sore throat occurred in Søborg and appeared to be connected with consumption of milk from Gladsaxe dairy. A sample was taken of the pooled milk to be delivered to customers: in 24-hr. cultures on blood agar plates, 0·5 million β-haemolytic streptococci per ml. milk were isolated.

Half-litre samples were taken of the milk of the 16 farms supplying the dairy, and cultures were grown on blood agar plates with 0·01, 0·001 and 0·0001 ml. of each sample. In the milk from one farm the number of β-haemolytic streptococci exceeded 5 million per ml. milk: serological investigation showed that they belonged to Lancefield's group A streptococcus. The cow responsible for infection had acute inflammation of the udder in one quarter, the milk from this quarter containing 1,700 million streptococci per ml. The animal had been milked by a cowman with a sore throat and a septic finger, bacteriological examination of material from which also showed the presence of β-haemolytic streptococci of Lancefield's group A, identical with the streptococci isolated from the milk of the cow with the affected quarter, and from all the sore-throat patients examined at the same time who had consumed milk from Gladsaxe dairy.—R. PETER JONES.

SÖNTGEN, K. (1942.) Besteht die Beurteilung des Herzklappenrotlaufes in der im Gesetz und seinen Ausführungsbestimmungen gültigen Form noch zu Recht? [**Is the designation "swine erysipelas heart and valve lesion" of the German meat-inspection law and its instructions still valid?**]—*Berl. Munch. tierärztl. Wschr.* Oct. 2nd. 296–297. **2069**

Swine erysipelas was widespread in Germany in 1940–41, but in many cases the course of the disease was mild and no inoculation was necessary. It was observed, however, that chronic endocarditis frequently followed 2–6 weeks after a mild attack, the symptoms being poor appetite, dullness, shortness of breath, coughing and raised temperature; there was usually no reddening of the skin. Inoculation was useless in these cases and slaughter was always necessary. At meat inspection typical valve lesions were always present, but seldom any other pathological change. Bacteriological examination of material from 67 cases of chronic erysipelas showed, however, that a septicaemic infection was also present in 44·1%, bacteria being found in the lymph nodes and internal organs, and in nine cases in the muscle tissue.

As such carcasses would not be considered fit for human consumption, S. recommends that material from all cases of chronic erysipelas with raised temperature should be submitted for bacteriological examination.

—ANN F. RUSSELL.

—. (1944.) **The decline of air-borne infections.**—*Brit. med. J.* Feb. 26th. 296–297. **2070**

In this annotation some interesting points arising from Dwight O'Hara's monograph on the subject [see *V. B.* **14.** 406] are discussed briefly. Since the beginning of this century, there has been a steady decline in the annual deaths from each of the four principal diseases of the respiratory tract. The decline is attributed to better living conditions—housing and food in particular—rather than to the efforts of the immunologist and hygienist.

O'Hara discusses the relative merits of two policies in combating disease, immunization and the elimination of the micro-organism; that is, rendering the individual resistant to infection, or ensuring that he shall not encounter it. In general, he states, immunity is the more reliable safeguard, but both methods should be employed, and there is an optimum point for each disease at which they should be balanced.

While the annotator is not in complete agreement with the author on several points, he nevertheless strongly recommends the essay, both for its statistical and other information, and for the deductions which it contains.—ISOBEL W. BROCKLEHURST.

*RIECK, W. (1942.) Die Entwicklung des Veterinärwesens in Finnland. [**Development of veterinary services in Finland.**]—*Dtsch. Tierärztebl.* **9.** 102–103. [Abst. from abst. in *Jber. Vet.-Med.* **70.** 570.] **2071**

During the periods of Swedish rule until 1808 and of Russian rule until 1917 Finland had no veterinary school, students studying in Sweden, Germany and Denmark. In 1786 a veterinary chair was established in the University of Turku and in 1794 it was placed in the medical faculty as a [presumably combined] chair of anatomy, surgery and veterinary science, but no veterinary diploma was awarded. Increased losses from animal disease resulted in a medical man being sent in 1822 to study the veterinary schools in foreign countries; he proposed that a veterinary school should be established, but no action was taken. Similar projects in 1863, 1891 and 1897 likewise did not materialize. In 1920, again in 1924 and finally in 1932, a commission proposed the establishment of a faculty with veterinary and agricultural divisions but R. is not aware whether this plan has been realized.

The veterinary services were under the control of the medical service until 1930 when a Veterinary Department was set up in the Ministry of Agriculture with a veterinary surgeon in charge. A supreme Veterinary Board was set up to which were appointed veterinary surgeons, doctors, lawyers and farmers to advise the Government in veterinary matters. In 1934 there were 258 veterinary surgeons in Finland comprising two veterinary councillors, three in the State Veterinary Laboratory, two teachers, two in agricultural schools, 55 district veterinary surgeons, 116 in administrative positions, 17 in the army, 53 in private practice and eight retired. The Veterinary Department of the Ministry of Agriculture confers the title of veterinary surgeon upon persons who have passed the necessary examinations, have spent four months as an assistant to a veterinary surgeon approved by the Government, and taken a three weeks' course on veterinary police regulations, animal disease, food inspection, animal husbandry and animal nutrition. District veterinary surgeons must previously have spent two years in agricultural practice and taken a month's course and passed an examination on veterinary police regulations and meat inspection. In all municipalities of over 4,000 inhabitants, meat inspection is obligatory. The veterinary surgeons who become meat inspectors must pass an examination after taking a two months' course at an abattoir. In 1935 the chief of the Veterinary Department, Dr. Kankaapää, was also in charge of the research laboratory which produced vaccines, sera and other biological products. The Chief of the Veterinary Department in the Defence Ministry, a veterinary colonel, is in charge of the Army Veterinary Department with an assistant of the rank of lieutenant-colonel. The veterinary surgeons of cavalry brigades and divisional veterinary officers have also the rank of lieutenant-colonel. Attached to each artillery regiment is a veterinary commander and to each cavalry regiment a veterinary captain. At the Army riding school there is a veterinary commander and with each horse battery a veterinary captain. In 1939, during the Russian invasion, female assistants [qualifications and status not described] worked in the Army veterinary hospitals. In the year prior to publication the Army Veterinary Service was further enlarged.—T. E. GIBSON.

RIECK, W. (1942.) Zur Entwicklung des Veterinärwesens im Irak. [**The development of veterinary affairs in Iraq.**]—*Dtsch. Tierärztebl.* **9.** 148. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 156.] **2072**

Veterinary activities in each province are administered by a veterinary inspector-general who has under him many district veterinary officers. A special veterinary police service controlled by veterinary officials supervises the frontier stations and the caravan routes. In order to eliminate diseases which have been introduced a civil veterinary department has been created, consisting in part of veterinary surgeons, and in part of unqualified assistants. Meat inspection is controlled by 18 lay inspectors. Veterinary activities are centred on the veterinary bacteriological laboratory at Bagdad where refresher courses for veterinary surgeons and other officials are provided. Treatment of animals is performed at 12 state clinics, at which investigations into disease and operations are carried out without charge, medicines being provided free from eight veterinary pharmacies.

For breeding of Arab horses a model stock farm has been established at Bagdad.—U. F. RICHARDSON.

GRINI, O. (1944.) Veterinaerinstituttet 30 år 19. november. [**The Norwegian Veterinary Institute, 30**

years old, November, 1944.]—*Norsk VetTidsskr.* **56.** 337–342. **2073**

A laboratory carrying out veterinary research has been in existence in Norway from 1891. In 1911, since this had become inadequate, the Norwegian Government decided to establish a Veterinary Institute with Malm as director, Holth as head of the serum department and Horne as head of the pathological department. Building was begun on the present site and was completed in 1914.

Serum treatment of animal diseases was not used in Norway before 1900 and the first trials of it were made with pasteurella serum in cases of swine fever. In 1907 tick fever serum was sent to Norway for trial and supplies were later obtained from Copenhagen. After the opening of the Institute, besides helping in diagnosis and giving advice, its principal task was the production of sera for the treatment of local diseases and of vaccines and tuberculin and mallein for diagnostic purposes. For many years the serum production practically supplied the country's needs but latterly, owing to lack of space, importation from other countries has been necessary.

The staff of the Institute has taken a direct part in field work, especially in outbreaks of foot and mouth disease and anthrax. A great deal of material has been examined throughout the years. New and unknown diseases have also had to be dealt with, especially those of a parasitic nature, to which the fox showed itself highly susceptible; in other Norwegian domestic animals the incidence of parasitic disease is low. The expansion of the fur animal industry has added greatly to the work.

Holth on his appointment took up the diagnosis of contagious abortion by blood tests, and to-day the greater part of Norway is free from this disease. Work on tuberculin and, for some years, the diagnosis of fowl typhoid by means of blood examinations, have taken up much of the Institute's time.

Many papers have been published by the Institute both in Norwegian and foreign journals.

As the only veterinary laboratory in Norway, the Institute plays an important part in everything appertaining to veterinary science and practice. To-day there is also a Norwegian Veterinary High School with Holth, now director of the Institute, as its rector and instructor in bacteriology.—M. E. ROBERTSON.

FIGUEIREDO, J. M. (1944.) Era justa a orientação do nosso curso? [**Suggestions for increasing the scope of training for veterinarians in Portugal.**]—*Rev. Med. vet., Lisboa.* **39.** 412–424. **2074**

F. discusses the course of instruction at the Portuguese veterinary school, arguing that it is defective and ill balanced, and overemphasizes the horse and its diseases. Parts of the course are drawn too closely from human medicine. He pleads for a modern veterinary course in keeping with the country's farm animal population of 80,000 horses, 120,000 mules, 240,000 donkeys, 830,000 cattle, 3,890,000 sheep, 1,196,000 goats and 1,177,000 swine.—J. E.

—. (1943.) Escola Superior de Veterinária do Paraná. [**The veterinary college at Parana, Brazil.**]—*Bol. Soc. brasil. Med. vet.* **12.** 265–268. **2075**

This school was founded in 1931 as a section of the School of Agriculture, but was made a separate institution in 1934. An outline of the four years' course is given, also a selection of photographs of laboratories, etc.—J. E.

See also absts. **1932** (undulant fever), **1977** (cysticercosis and meat inspection), **2076** (phosphatase test), **2107** (bacteria and the milk supply).

TECHNIQUE AND APPARATUS

HANSEN, A. C. (1944.) En praktisk Aendring af en Detaille ved Udførelsen af Fosfataseprøven. [**A practical alteration in the technique of the phosphatase test.**]—*Maanedsskr. Dyrlaeger.* **56.** 46–47. **2076**

In carrying out the phosphatase test, H. found that it was advantageous to use rubber stoppers with a 4 mm. perforation, and when adding basic lead acetate solution to employ a slightly modified standard dropping bottle with a 4 cm. tip, *i.e.*, 1·5 cm. longer than the rubber stopper used. The boiling of tubes, cooling, and the addition of basic lead acetate solution can be carried out without removing the stoppers, the extended tip of the dropping bottle being passed through the perforation. After the final addition of the solution the hole in the stopper can be closed during shaking by a small glass pin or a rubber-covered cap, which is wiped between the shaking of the several tubes. The dropping bottle should be kept in a tube containing distilled water. On the test-tube there should be a sand-blown area on which notes can be made with a lead pencil; marks made by ordinary grease pencils are frequently effaced during boiling.—R. PETER JONES.

CAMERON, G. M., & CASTLES, R. (1945.) **Comparison of methods adaptable to production line examination of sputum for tubercle bacilli.**—*J. Lab. clin. Med.* **30.** 163–168. [Authors' summary copied *verbatim.*] **2077**

In this comparative study of four methods used to prepare sputa for the identification of tubercle bacilli, the clorox digestion method proved to be the most efficient. With it, the greater percentage of positive specimens were obtained and there was a greater concentration of organisms per microscopic field. Because of this greater concentration, fewer fields had to be examined to find acid-fast bacilli. Furthermore, preparations so made have no visible extraneous material in the microscopic field to interfere with the search. The clorox digestion method lends itself readily to use in a public health laboratory where many specimens of sputum are received for microscopic examination.

POWELSON, D. M., & MCCARTER, J. R. (1944.) **Serum albumin as a food for human tubercle bacilli.**—*J. Bact.* **48.** 479–481. [Authors' summary copied *verbatim.*] **2078**

Dorset's synthetic agar medium with human serum albumin has been shown to be comparable in efficiency to Corper's egg-yolk medium. For experimental work in which plate counts of human tubercle bacilli are essential, the use of Dorset's synthetic agar medium with about 0·5% of serum albumin is suggested. The addition of serum albumin to a liquid medium would probably also allow the growth of single cells of human tubercle bacilli.

NELSON, F. E. (1944.) **Factors which influence the growth of heat-treated bacteria. II. Further studies on media.**—*J. Bact.* **48.** 473–477. [Author's conclusions copied *verbatim.*] [For part I, see *V. B.* **14.** 109.] **2079**

Variation of the tryptone content of the medium, addition of thioglycollic acid, and differences in the time of addition of peptone in the preparation of the medium may influence the numbers of certain nonsporulating

bacteria which develop into countable colonies following sublethal heat treatment.

The observed variations in colony counts of heat-treated bacteria may result from alterations in the physico-chemical character of the medium; a more reduced potential is considered favorable for the initiation of growth of heat-injured cells and thus for the formation of greater numbers of countable colonies.

LEBLOND, C. P. (1943.) **Locating iodine in tissues autographically, especially after fixation by freezing and drying.**—*Stain Tech.* **18.** 159–163. **2080**

Unstained histological sections of the thyroid of an animal treated with radioactive iodine are placed in contact with the gelatin side of medium lantern slide plates. The radioactive iodine in the section affects the photographic plate. After prolonged exposure the plate is developed and fixed by routine methods. An "autograph" of the section is obtained on the plate.—M. C.

CHORINE, V. (1942.) Culture du spirochète de la poule. [**Cultivation of avian spirochaetes.**]—*Ann. Inst. Pasteur.* **68.** 524–527. **2081**

A medium is described which, it is claimed, is easy to prepare and in which *Spirochaeta gallinarum* grows readily and retains its virulence for longer periods than in other media. The medium consists of 150 ml. 0·5% peptone water and 30 ml. fresh unheated rabbit serum. The peptone is dissolved by boiling for 5 min. in 0·75% saline. After cooling, the pH of the solution is adjusted to 7·4–7·5. It is then sterilized in the autoclave at 115°C. for 20 min., filtered, bottled and again sterilized. C. uses narrow test-tubes each containing 2·5–3 ml. medium. The surface of the medium is covered with a layer of sterile liquid paraffin about 1 cm. deep.

At the time the tubes are inoculated, 0·25 ml. fresh laked and filtered g. pig blood is added to each. This laked blood is prepared as follows. Blood is collected by cardiac puncture and defibrinated by shaking with glass beads. 2 vols. redistilled water are mixed with the defibrinated blood. Two hours later a solution of 10% NaCl, one-tenth the volume of the redistilled water is added. The whole is centrifuged at 6,000–8,000 r.p.m. for 20 min., and the supernatant liquid is filtered through a Chamberland L2 candle. This blood can be kept in a refrigerator for as long as 12 days.

Spirochaeta gallinarum retains its virulence for at least four months in this medium.—M. C.

LUBKIN, V., & CARSTEN, M. (1944.) **Dehydration in histologic embedding eliminated by the use of a water-soluble synthetic plastic.**—*Arch. Path.* **38.** 229–232. **2082**

A technique is described for embedding histological material without dehydrating. Formalin-fixed tissue is placed in a mixture of a 20% solution of a water-dispersible plastic and polyvinyl alcohol, and 20% glycerin is added. Hardening takes place slowly, averaging two weeks. Sectioning is carried out as for celloidin, except that the block is moistened with water in place of alcohol. Thin sections can be cut, and are flattened on lukewarm water. All ordinary staining techniques can be used and mounting is done in balsam. Blocks can be preserved in a moist atmosphere containing a little formaldehyde.

Most tissues can be sectioned satisfactorily with this method, but highly fatty tissues are incompletely penetrated.

Brain and cord give particularly good results. A slight drawback is in photomicrography, when a slight unevenness in the dispersion of light on the plate is found at higher magnifications, due to refraction of light through the film of polyvinyl alcohol.

—JOHN G. CAMPBELL.

BRODY, D. A., & QUIGLEY, J. P. (1944.) **Application of the "inductograph" to the registration of movements, particularly of body structures such as the pyloric sphincter.**—*J. Lab. clin. Med.* **29.** 863–867. **2083**

A description is given of the construction and use of an apparatus termed an "inductograph". This comprises two suitable electromagnetic coils (a primary and a secondary), which are fastened at opposite sides of the tissue of which the movement is being studied; as the tissue contracts or relaxes, the coils approach or recede with the corresponding induction of more or less current in the secondary coil. It is stated that the apparatus is suitable for lengthy experiments on unanaesthetized subjects in which the coils are embedded or are fastened to the external surfaces of the body.

The authors employed the apparatus for the study of the movements of the pyloric sphincter in 32 dogs. The coils were placed with aseptic precautions so that their cores and the sphincter diameter were in the same line. The lead wires from the coils were sutured along the lesser and greater curvatures of the pyloric antrum and finally brought to the outside through a stab wound. Both coils and lead wires were covered with omental tissue.

Various possible errors and artefacts are described. A detailed description of the recorded motility of the pyloric sphincter is to be given elsewhere.—A. N. W.

CRESCITELLI, F., & GARDNER, E. (1945.) **The application of a hot wire and thermocouple for recording surface pulsations in the human body.**—*J. Lab. clin. Med.* **30.** 63–74. [Authors' summary and conclusions copied *verbatim*.] **2084**

1. For the registration of the pulse from the surface of the human body a method is described which employs a heating coil and thermocouple. The method makes use of the E.M.F. developed across the two junctions of the thermocouple as a small mass of warm air impinges upon the active junction with each pulse.

2. Records are shown of the pulse obtained from the fingers, toes, radial artery, brachial artery, carotid artery, temporal artery, and the apex beat. The precautions necessary for getting a successful record with this method, as well as some of the technical details connected with its operation, are pointed out.

3. The method has been evaluated by comparing the finger pulse obtained through its use with records of the finger pulse recorded by means of the photoelectric plethysmograph. It is shown that the primary pulse wave and the secondary waves are portrayed in their correct time relations. The digital crest time agrees well with figures previously published and obtained with the photoelectric technique. The chief limitation of the method results from its poor low frequency response, so that the catacrotic limb descends prematurely, causing the dicrotic notch and dicrotic wave to appear low in the record.

4. A number of possible applications for the technique are suggested, including its use in the measurement of the pulse velocity, its use as a unit in blood pressure determinations, and its possible employment in cases of disturbance in the time relations of the components of the pulse wave.

MACLAGAN, N. F. (1944.) **Laboratory tests in the diagnosis of liver disease. A report on three procedures.**—*Brit. med. J.* Sept. 16th. 363–365. **2085**

The serum colloidal gold reaction is usually increased in general liver disease and the serum alkaline phosphatase in biliary obstruction. 75 of 100 cases of human jaundice were differentiated into these two types of liver disease by means of the gold and phosphatase

ests. The inclusion of the galactose index test gave an even more accurate differentiation.—A. B. P.

HAMMARSTEN, G. (1943.) Die Züchtung von Ratten und Mäusen für Versuchszwecke. [**Breeding of rats and mice for use in research.**]—*Zbl. Bakt. I.* (*Orig.*). **150.** 86–96. **2086**

H. describes the types of animal most suitable for research and considers that although the white rat is most commonly used, the black-white variant has some advantages, being often larger and more resistant to disease. For breeding, one male should be mated with three or four females; each female can produce five or six litters in a life-time and there may be as many as eighteen in a litter, but the usual number is eight to ten. The characteristics and development of new-born rats are described and similar details are given for white mice.

H. describes the best types of cage and gives the compositions of three satisfactory food mixtures for rats and mice. The diseases of rats and mice in captivity are considered. The only bacterial infections likely to cause trouble with rats are enteritis and pneumonia but mice are more prone to bacterial infections than are rats. Lice and mange mites are important parasites of rats.

Methods for killing rats and mice are discussed.
—A. J. MEE.

WALKER, E. P. (1942.) **Care of captive animals.**—*Rep. Smithson. Instn, 1941.* pp. 305–366. **2087**

This paper by the Assistant Director of the National Zoological Park contains notes on the feeding and maintenance of many categories of mammals, birds, reptiles, amphibians, fish and invertebrates. The subject is treated throughout from a humane but essentially practical point of view. A selected bibliography comprises many useful references. The accompanying illustrations include photographs of exercising wheels, a feeder tube for humming birds, and certain deformities which have occurred in animals during captivity.
—A. N. W.

See also absts. **1943** (preparation of influenza vaccines), **1962** (virus-neutralization test in eggs).

MISCELLANEOUS

—. (1945.) [**Veterinary education in India—Special educational number.**]—*Indian vet. J.* **21.** No. 4. 197–292. **2088**

This special number contains articles discussing the development of veterinary education in India, the present position, and changes considered to be necessary in the future. ABDUSSALAM suggested that more veterinary colleges are required, indicating that the existing five colleges are inadequate to cover the needs of the country and that eight more should be opened. Emphasis was given to the importance of affiliation to universities and to the advantages to be gained by enabling the teachers to undertake research work.

Some speakers were of the opinion that in the later stages of the curriculum, there should be opportunities for specialization in such subjects as animal husbandry, hospital work, municipal hygiene etc. It was considered that a livestock farm should be attached to each college in order that the students should have the opportunity for the practical training in animal husbandry which could be given on such farms. One speaker advocated the establishment of one central veterinary college to train selected students to a higher standard than would be given in the other colleges.
—M. ABDUSSALAM.

REDDY, D. V. S. (1944.) **Veterinary medicine in Mouryan times (4th century B.C.).**—*Indian vet. J.* **21.** 320–324. **2089**

The article is based on Kautilya's "Arthasastra", a treatise on political economy, written in the 4th century B.C. Passages are quoted from this book about the management of horses, elephants and cattle. The duties of veterinary officers are defined, and mention is made of the regulations in existence at the time regarding slaughter-houses and punishment for cruelty to animals.—H. L. PURI.

VAN DE PAS, L. (1944.) Biblioteca agronómica y veterinaria. VIImo Tomo. I. Compendio de embriología. II. Compendio de teratología. [**Agronomical and veterinary library, University of Buenos Aires. Volume VII.—I. Summary of embryology. II. Summary of teratology.**] pp. 151. Buenos Aires: Universidad de Buenos Aires, Facultad de Agronomía y Veterinaria. 8vo. **2090**

This volume is one of a series designed to form a reference library dealing with the various subjects studied by the Faculty of Agriculture and Veterinary Science of Buenos Aires University. This particular work is intended to serve only as a student's guide and as such should take its place in Spanish veterinary literature. The section on teratology is illustrated by photographs of a number of original specimens in the possession of the University.—W. M. HENDERSON.

KOSSMAG. (1944.) Über die Fernhaltung charakterlich nicht einwandfreier Tiere von der Landeszucht. [**Withholding from breeding of animals of objectionable or savage disposition.**]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 12. **2091**

K. considers that vicious animals, particularly bulls and horses, should not be used for breeding since it is likely that the vicious habits may be transmitted to their progeny.—E. G. WHITE.

SPENCER, R. R., & MELROY, M. B. (1943.) **Principles of species adjustment. I. Continuous exposure.**—*J. nat. Cancer Inst.* **4.** 249–256. **2092**

SPENCER, R. R., MELROY, M. B., & CALNAN, D. (1943.) **Principles of species adjustment. II. Discontinuous exposure.**—*Ibid.* 257–263. **2093**

I. The authors report results of experiments which, they claim, provide proof of their original contention that "the continuous exposure of a species to an unfavorable environment may not be fatal to individual organisms for a number of generations, or cell division cycles, but in due time all individuals of the species will die". The organisms studied were three species of bacteria (*Salmonella typhi*, *Bacterium coli* and *Streptococcus haemolyticus*), a species of *Paramoecium* and a platyhelminth.

The unfavourable environments were provided by increased temperature, the presence of certain aniline dyes, carcinogens, and X-irradiation.

II. Continuing their investigations, the authors state that discontinuous or alternating exposure of organisms to an unfavourable environment (at the time of writing only two of the bacterial species named above had been used with temperature changes as the unfavourable environment) results in successful adaptation to the same intensity, and by degrees to a greater intensity of the environment that is fatal when the exposure is continuous.—JOHN G. CAMPBELL.

REPORTS

NEW ZEALAND. (1943.) **New Zealand Dairy Board. Nineteenth annual report and statement of accounts for period of twelve months ended 31st July, 1943.** pp. 39. Items of veterinary interest pp. 7–9 and 34–36. Wellington: The Board. 4to. **2091**

The Dairy Board and the Department of Agriculture have been closely associated in investigating various aspects of the health and production of dairy stock. The Director of the Animal Research Division of the Department of Agriculture [FILMER, J. F.] reported on the activities of the Division.

Experiments conducted at Ruakura indicated that early detection and treatment of BOVINE MASTITIS offer some hope of reasonable control. Diagnostic methods suitable for the field are to be tested. A list is given of therapeutic agents tested. Though several of these have been fairly successful in clearing up infection they have seldom resulted in the return of the affected quarter to full lactation. A trial has been commenced to determine whether sudden changes in diet precipitate outbreaks of mastitis and a three years' project has been initiated, with a view to establishing any possible correlation between the incidence of mastitis and such environmental factors as climate, diet, shed hygiene and milking machines. A further season's investigation of non-stripping was conducted, for which the results are not yet available.

In 1,223 herds in six herd-improvement areas a general survey of the MASTITIS problem is being attempted and tables are presented indicating its monthly incidence in these districts. Figures indicate the incidence of clinical mastitis as associated with sore teats, hand milking, hand stripping and various types of milking machines. An attempt was made to determine its effect on production where it was possible to analyse the production records of cows in the season prior to being affected. It appeared that approximately half the mature cows severely affected are culled during each year and that their production has obviously suffered. The production of those which recovered and were retained in the herd does not appear to be very greatly affected. In the remaining portion which were retained in the herd although still affected, an appreciable fall in production is still evident.

Free vaccination of calves against CONTAGIOUS ABORTION with strain 19 vaccine was made available to farmers. 17,882 calves in 1,160 herds were vaccinated and in a number of badly infected herds heifers and mature cows were also included in the scheme. Experiments have been continued on the use of hormones to increase production in aborting cows.

It was shown that pasturing for six weeks before calving, on pasture which had been allowed to grow for a period ungrazed, enabled cows to start lactation at a higher level and to reach their peak earlier than cows poorly fed prior to calving. It was indicated that the most practical method of improving calf nutrition was to rotate the grazing of the calves ahead of that of the cows after weaning. Experiments demonstrated that good pasture is more valuable to pigs than cod liver oil or other vitamin concentrates under North Island conditions, and that good grazing saves 1–3 gal. of milk per day during fattening; they also provided further evidence of the importance of adequate nutrition to sows immediately before and after farrowing.

Over a large proportion of the peat areas in the Auckland and North Auckland districts dairy cattle suffer from what is known as "PEAT SCOURS". Preliminary investigations have provided evidence that the condition is due to COPPER DEFICIENCY and experiments are being conducted to determine the best methods for its correction.

The bull semen testing service was again made available, and ARTIFICIAL INSEMINATION was again practised at Ruakura. In one herd two yearling bulls were used and the percentages of conceptions were rather low. In another herd using a more mature bull, 66% held to the first service. Artificial insemination is to be tested on a field scale in the coming year: three proven sires are to be used and it is anticipated that at least 1,000 cows will be inseminated.

Investigations have been initiated on the inherited red cell characters in dairy cattle recently reported by American workers.

An outbreak of MANGOLD POISONING involving the loss of 200 pigs following the inadequate cooking of mangolds was investigated. Further experiments are being conducted to determine the growth and storage conditions under which mangolds become toxic.

Experiments showed that milk and flesh from cows fed ergot in toxic doses are free from alkaloids.
—M. B. BUDDLE.

UGANDA. (1944.) **Medical Department. Annual report for the year ended 31st December, 1943.** pp. 9. Items of veterinary interest p. 4. Entebbe: Govt. Printer. 8vo. 1s. **2092**

In investigations into yellow fever, various species of African monkeys have been incriminated as possible carriers. A hyrax was the only wild animal other than primates which was found to be immune. The yellow fever virus was not found in forest mosquitoes, but two new viruses have been isolated from them.

The transmission of sleeping sickness in recent outbreaks by *Glossina pallidipes* has been confirmed, but evidence that *G. palpalis* is involved has not been forthcoming.—U. F. RICHARDSON.

I. TRINIDAD & TOBAGO. (1943.) **[Report of the Senior] Veterinary [Officer, 1942].** [METIVIER, H. V. M.]—*Adm. Rep. Dir. Agric. Trin., 1942.* pp. 14–15. **2093**

II. TRINIDAD & TOBAGO. (1944.) **[Report of the Senior] Veterinary [Officer, 1943].** [METIVIER, H. V. M.]—*Ibid., 1943.* pp. 4 & 14–16. **2094**

I. No case of ANTHRAX was confirmed. 555 cattle were vaccinated.

Routine testing of dairy cattle for TUBERCULOSIS was continued in rural districts supplying milk to Port of Spain and Scarborough. In tests of 1,400 cows 2·85% were infected. Two cases were found at the abattoirs. The incidence of BOVINE CONTAGIOUS ABORTION had decreased.

Owing to an outbreak of FOOT AND MOUTH DISEASE in British Guiana restrictions were imposed on imports of animals.

A case of RABIES in a human being occurred following a cat bite. No extension of the disease followed this outbreak. 211 stray dogs were destroyed. The Colony remained free from PARALYTIC RABIES (bat transmitted). Bat destruction was continued. 621 bats examined, including 486 *Desmodus* spp., were free from Negri bodies. No case of EQUINE ENCEPHALOMYELITIS occurred. 1,828 pigs affected with SWINE FEVER were slaughtered. No vaccinations were carried out.

PARASITIC GASTRITIS, PNEUMONIA in calves, STRANGLES and INFLUENZA in equines were also reported.

20,500 cattle, 173 horses, 35 mules, 70 donkeys, 2,478 sheep, 6,369 goats, 23 dogs, and two cats were inspected.

Research in animal husbandry included artificial

insemination and other breeding problems of cattle and poultry.

II. There has been an extension of facilities for livestock breeding. Bulls, donkey jacks, boars and billy goats were stationed in country districts and at the Government Stock Farms in Trinidad and Tobago.

There were no cases of ANTHRAX. 412 cattle were immunized. Routine tuberculin testing of dairy cows was continued ; of 1,200 cows tested only three reacted. There has been a decrease in the number of outbreaks of BOVINE BRUCELLOSIS. Control is by quarantine measures.

FOOT AND MOUTH disease was under control in British Guiana and restrictions on the importation of all except cloven-footed animals had been removed.

There were no outbreaks of ordinary RABIES. 189 dogs were destroyed. There were no cases of PARALYTIC RABIES (bat-transmitted) and bats examined were free from Negri bodies.

There were three outbreaks of Cow Pox. These were caused by a vaccination campaign in progress against smallpox which spread vaccinia infection *via* the milkers.

There were 266 cases of EQUINE ENCEPHALOMYELITIS and 211 of these died in the south of the Colony. 5,000 animals were given vaccine obtained from Venezuela. The *Mansonia titillans* complex of mosquitoes was shown to be the common vector.

SWINE FEVER was confined to one county : 2,018 pigs were slaughtered.

Cases of TETANUS, PNEUMONIA in calves, STRANGLES and INFLUENZA also occurred.

26,871 animals were examined on importation. These included 19,053 cattle and 7,557 sheep and goats.

Studies on artificial insemination were carried out at the Government Stock Farm.—J. A. GRIFFITHS.

I. ST. LUCIA. (1939.) **Report on the Department of Agriculture St. Lucia, 1937.** pp. 44. Items of veterinary interest p. 35. St. Lucia : Govt. Printing Off. fcp. 6d. **2095**

II. ST. LUCIA. (1941.) **Report on the Department of Agriculture St. Lucia, 1940.** pp. 12. Items of veterinary interest p. 8. St. Lucia : Govt. Printing Off. fcp. 6d. **2096**

III. ST. LUCIA. (1943.) **Report on the Department of Agriculture St. Lucia, 1942.** pp. 14. Items of veterinary interest pp. 5–6. St. Lucia : Govt. Printing Off. fcp. 6d. [For report for 1941, see *V. B.* **15.** 37.] **2097**

IV. ST. LUCIA. (1944.) **Report on the Department of Agriculture St. Lucia, 1943.** pp. 16. Items of veterinary interest pp. 6 & 12. St. Lucia : Govt. Printing Off. fcp. 6d. **2098**

I. A visit was paid in 1937 by a veterinary officer from Trinidad to advise on veterinary and livestock matters.

II. There was an increase in the numbers of animals and poultry imported. *Stephanurus dentatus* (KIDNEY WORM) INFESTATION was diagnosed in a sow.

III. The SWINE FEVER epizootic of 1941 [see *V. B* **15.** 37] came to an end early in 1942. Crystal-violet vaccine was being used. Livestock products are quite inadequate to meet local demands. Experience shows that livestock can only be reared when, contrary to the local custom, they are adequately fed and also regularly treated for HELMINTH INFESTATION. Pig rearing has been taken up by several estate owners. The Government stock farm is raising pigs, poultry and rabbits.

IV. There were no outbreaks of SWINE FEVER. 359 pigs were vaccinated.

Satisfactory progress is being made in the raising of livestock. To encourage milk production a premium of ½d. a pint is granted to approved dairymen. 65 animals and 255 poultry were imported, an increase due to the co-operation of the Barbados Agricultural Department.—J. A. GRIFFITHS.

I. U.S.A. **Reducing live stock diseases and losses in marketing. 1938 report of the National Live Stock Loss Prevention Board.** pp. 23. Chicago, Ill. : The Board. 8vo. **2099**

II. U.S.A. **Progress in reducing live stock diseases and waste in marketing. 1939 report of the National Live Stock Loss Prevention Board.** pp. 31. Evanston, Ill. : The Board. 8vo. **2100**

III. U.S.A. **Live stock marketing losses. 1940 report of the National Live Stock Prevention Board.** pp. 31. Evanston, Ill. : The Board. 8vo. **2101**

IV. U.S.A. **Activities to reduce waste of meat in marketing livestock. 1943 report of the National Live Stock Loss Prevention Board.** pp. 25. Evanston, Ill. : The Board. 4to. Mimeographed. [Reports for 1941 & 1942 not yet received.] **2102**

I–IV. Annual statistical records are given of losses of meat as a result of disease and other causes.

General educational work undertaken by the Board included lectures, demonstrations and radio talks, and the distribution of leaflets on such subjects as swine erysipelas, TB. in pigs and poultry and bruising and internal injuries to cattle. Much publicity was given to the prevention of loss in livestock. Losses are chiefly incurred in transit, mainly from bruising, and it is suggested that if more meat producers, carriers and stockyard haulers could visit packing plants to see the trimming-out of bruised parts, they would realize better the importance of careful handling. Competitions are frequently held to stimulate this care and competitors have exhibited, amongst other things, improved designs in trucks, partitions, hurdles and loading ramps. Horns also are a major cause of injury and a programme of dehorning cattle is being fostered ; wider gates to prevent loin injuries are also being encouraged.

In 1917, 76,807 hogs or 0·19%, and in 1943, 13,051 or 0·022% of the total kill were condemned for TB. In 1917, 40,746 cattle or 0·43%, and in 1943, 1,248 or 0·01% of the total kill were condemned for the same disease. Cattle condemnations have decreased more than three times as much as those of pigs. It is contended that if all tuberculous pigs had the bovine type of infection the decline in losses would be similar to that in cattle ; many pigs, however, are infected with the avian type from mingling with tuberculous poultry on farms. The disease is particularly prevalent amongst chickens in the north central states where in 1938, on the average, one out of every eleven pigs slaughtered under Federal inspection showed tuberculous lesions : these were mostly in throat lymph nodes and caused many pigs to be condemned. A reduction has been achieved by a campaign to persuade farmers to dispose of the entire poultry flock at the end of the first egg-laying year, since normally TB. is rare amongst pullets as compared with older hens. The loss in swine from avian TB. is large but the loss to the poultry industry is much larger. Except in a few establishments there is no Federal P.M. inspection of poultry.

The reports are well illustrated and many examples are given of bruised carcasses and hides showing scratches by wires and other sharp objects.—H. E. B.

U.S.A. (1943.) **Annual report of the Gorgas Memorial Laboratory [Panama], 1942.** [CLARK, H. C.] pp. 24. Items of veterinary interest pp. 2, 5–6 & 16–20. Washington, D.C. : U.S. Govt. Printing Off. 8vo. **2103**

The Corozal veterinary station breeds all small animals for use at the Laboratory and during the year supplied about 1,800 g. pigs.

Studies on TRYPANOSOMIASIS revealed four cases of MURRINA [*T. equinum* infection] in horses. Cases of this infection, although previously very common in the Panama Canal Zone, had not been recorded since 1931. In 1940, cases of *T. vivax* infection of cattle were recorded for the first time in the Zone, the infection having apparently been introduced from Colombia; the hornfly (*Lyperosia irritans*) is considered to be the probable vector of the infection.

Considerable entomological work has been undertaken. Studies on horseflies (tabanids) have revealed so far 89 species, more than one-third of which are new to science. Tick identification has resulted in the listing of one species of *Argas*, five of *Ornithodorus*, three of *Ixodes*, one of *Haemaphysalis*, one of *Dermacentor*, one of *Rhipicephalus*, one of *Boophilus*, and nine of *Amblyomma*. Four species of sandflies (*Phlebotomus*) have also been identified; these are the vectors of American LEISHMANIASIS.

A veterinary surgeon was employed during the year by the Republic of Panama to make a general survey of the domestic animal situation and to offer advice in animal breeding and disease control.—D. D. OGILVIE.

See also abst. **1918** (Committee of Animal Health, National Research Council, U.S.A.).

BOOK REVIEWS

CHALMERS, C. H. [B.Sc. (Edin.), N.D.A.] (1945.) **Bacteria in relation to the milk supply. A practical guide for the commercial bacteriologist.** pp. vii + 272. 55 figs. London: Edward Arnold & Co. 3rd Edit. 8vo. 8s. 6d. **2104**

Although this book is primarily intended for the commercial dairy bacteriologist, it will prove a valuable source of information to public health workers and others concerned with the production and control of milk. The book is essentially a "practical" guide and it is evident that Chalmers writes with first-hand knowledge of the subject.

The book is divided into two parts. The first part, which forms by far the greater portion of the work, deals with the routine examination of milk and water, investigation into the causes of abnormal conditions and taints in milk, the isolation and determination of the numbers of viable organisms, the extent of faecal contamination and lastly the control of the production and processing of milk.

The second part of the book is concerned with general bacteriological technique, the care of apparatus, the preparation of culture media and the cultivation, isolation and identification of micro-organisms. Appendixes deal with the composition and preparation of various media, stains, chemical reagents and indicators.

The general veterinary reader will probably find some of the most interesting reading in the chapter dealing with taints and abnormal conditions in milk, which explains concisely the causes of the most common abnormalities to be encountered and the tests for ascertaining these causes.

Another chapter deals with hygienic milking, the control of dairy plant and the various parts of the equipment at the farm and the dairy which require constant supervision. Pasteurization and other heat treatments of milk—including the high temperature, short time method—are concisely dealt with, especially with regard to the legal requirements. The phosphatase test, the methylene-blue and resazurin tests are explained and their merits discussed.

The book can be recommended as a useful source of reference to all veterinary surgeons who are interested in many aspects of milk production and control.

—H. E. BYWATER.

COLE, F. J. [D.Sc. (Oxon), F.R.S., Emeritus Professor of Zoology, University of Reading]. (1944.) **A history of comparative anatomy from Aristotle to the eighteenth century.** pp. viii + 524. 200 figs. London: Macmillan & Co., Ltd. 8vo. 30s. **2105**

This book will be welcomed by all interested in the history and romance of biology. Not only should such chronicles be read for their intrinsic worth—and here one can detect the touch of a master assessing the value of past masters—but also, as is mentioned here, because they demonstrate the pitfalls which must be avoided, state the work which has been done and introduce a philosophical interest to science.

As Cole unfolds the story of the birth and development of comparative anatomy, the value to the student of human anatomy of the comparative approach becomes apparent. After the introduction comes a tribute to Aristotle and Galen, which serves to explain the domineering effect of the Galenic and Peripatetic schools over the minds of men up to the sixteenth century. At the end of this period two figures stood out: the brilliant and universally accepted Leonardo da Vinci, an artist in every sense of the word, and Vesalius. There would be some who would criticize Cole's treatment of Vesalius, but, as he points out, Vesalius did not appear interested in the comparative method and, therefore, it cannot be expected that he would be granted a major place in this review. It is not without interest that the so-styled "pioneer of the comparative method in anatomy", Pierre Belon, also lived at this time.

In the next chapter, on the development of craftsmanship, the Italian veterinarian Ruini, whose anatomy of the horse was published in 1598, receives praise, although Cole, unlike Sir Frederick Smith, will not admit that Ruini has any right to be associated with the discovery of the circulation of blood before Harvey.

The genius of Harvey is approved in this chronicle not so much for his discovery of the circulation of blood, but as the man who vindicated the comparative and experimental methods. From Harvey onwards we have the period of modern science; C. reviews in turn its chief exponents up to the eighteenth century. Outstanding in the seventeenth century were the anatomists of the Dutch School with the untrained, impetuous Leeuwenhoek and the skilful Swammerdam at their head.

The introduction of collective research stimulated by the formation of academies and societies is then discussed, and the story is concluded with a discourse on anatomical museums, leading up to an appreciation of the Hunterian collection.

The text is illustrated throughout with excellent figures and the publishers are to be congratulated on the edition.—C. W. OTTAWAY.

See also absts. **2026** (results of vitamin and hormone research).

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